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THE OPHTHALMIC RECORD

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The February number will contain, among others, an original article by Hiram Woods, jr.; "Blindness following the Intoxicating use of Jamaica Ginger;" Report of six cases; one by Alexander Duane; "Nomenclature of Ocular Movements;" one by J. Walter Park; Two Cases with Ocular Symptoms of Hysteria and their Treatment.

The RECORD particularly desires short practical papers on any subject connected with Ophthalmology. These will be published at as early a date as possible. It is understood that, unless otherwise arranged, original articles when accepted are contributed to the RECORD exclusively. Illustrative cuts will be made at the expense of the journal and proofs for correction will be sent to authors when desired. Reprints with covers are furnished at cost. One hundred of these will be presented to authors *gratis* when a request for them is written on the original manuscript. The RECORD will be issued monthly and each number will contain about 54 pages of reading matter.

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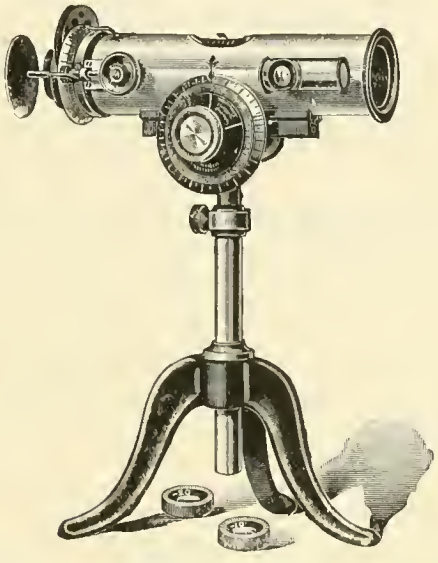

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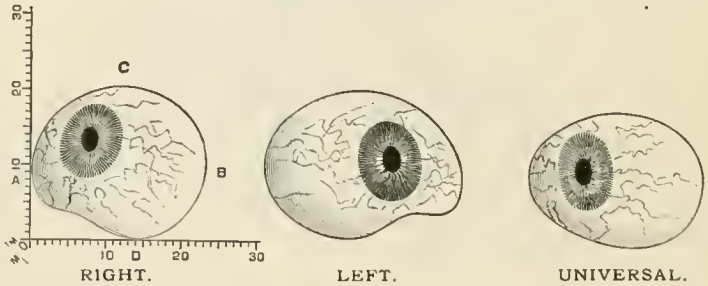

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7. Diameter of pupil?
8. Color of iris?
9. White of eye clear, yellowish, or Bluish?
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THE

OPHTHALMIC RECORD

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VIII. CHICAGO, JANUARY, 1899. NO. 1. NEW SERIES

ORIGINAL ARTICLES.

A CASE OF LEUCO-SARCOMA OF THE CHOROID IN A CHILD.

BY WILLIAM MERLE D'AUBIGNÉ CARHART, M.D.

Assistant Attending Surgeon, Manhattan Eye and Ear Hospital; Instructor in the New York Post Graduate Medical School; Ophthalmic and Aural Surgeon, Peekskill Helping Hand Hospital, etc.

NEW YORK.

Illustrated.

Thomas F., aged 4 years, was brought to the Manhattan Eye and Ear Hospital on August 23d, 1898, with the following clinical history:

One year ago the mother noticed a white appearance of the pupil of the patient's right eye, and soon afterward she realized that the child was blind in that eye. She is quite sure the child could see out of both eyes during early infancy, and he seemed to be fairly healthy, although never robust and strong, until last January, when he had an attack of cerebro-spinal meningitis. About that time the eyeball began to protrude perceptibly, but no particular pain in connection with the eye was observed. The child's general health, however, was much shattered by the illness in January, and he began to lose flesh and strength. During the past two months the protrusion of the eyeball has advanced rapidly, and considerable pain is apparently felt by the child in the eye itself.

On admission, the right eye is seen to protrude from its socket in a very marked manner and to be considerably enlarged. There is much congestion in the conjunctiva, and the lids are tense and swollen. The

cornea is quite hazy and denuded in places of its epithelium, while behind the widely dilated and fixed pupil, an opaque lens presents itself covered with inflammatory exudate. The tension of the eye is somewhat elevated, although not markedly so. Palpation reveals a mass apparently situated below and to the outer side of the eyeball.

The general condition of the boy is not at all good, for he is poorly nourished and feeble. He is peevish and irritable with almost a cephalic cry when disturbed, while if left quiet he seems to have a tendency to stupor.

As these symptoms point to decided systemic disturbance, with possible meningeal involvement, grave doubts arise as to the proper method of treatment. A diagnosis of malignant tumor is evident, but whether there is extension of the malignant process to the brain or elsewhere is not so plain, nor whether, if such extension has occurred, operation is justified in the present enfeebled condition of the child for a merely palliative result. The mother is told of the serious nature of the tumor and that an operation may possibly only prolong the child's life a short time, and with these facts, she is sent away to think over what she will decide to have done. She returns within a week with request for operation. On August 30th, under ether anæsthesia I enucleated the eye, finding a large mass of firm, dense, tumor tissue adherent to and springing from the outer, lower, posterior quadrant surface of the eyeball. The tumor surrounds the posterior hemisphere of the globe, involving the optic nerve, but its chief bulk extends outward, forward, and downward toward the malar bone. All of this tumor tissue was thoroughly removed, and the orbit was eviscerated of its contents down to the periosteum, a sharp curette being carefully used with the finger as a guide, and the optic nerve being severed as far within the optic foramen as possible. Considerable, but not excessive, hemorrhage occurred, which was easily checked by packing the orbit with iodoform gauze upon the completion of the operation. The tumor itself did not seem to be vascular to any great extent. The patient's condition during the operation required rapidity of work and necessitated some stimulation, but recovery from anæsthesia was uneventful and prompt. A very gratifying change was seen within a few days in the general health of the boy. The tendency to stupor passed off, and there was little or no irritable crying, with entire freedom from pain. The child seemed much brighter and stronger in every way, and within two weeks was thought well enough to leave the ward and to report daily to the dispensary for the necessary dressing. The orbit has been loosely packed with iodoform gauze and covered with a light pro-

FIG. 1.

Gross specimen showing sarcoma breaking through sclera.
(Actual size.)

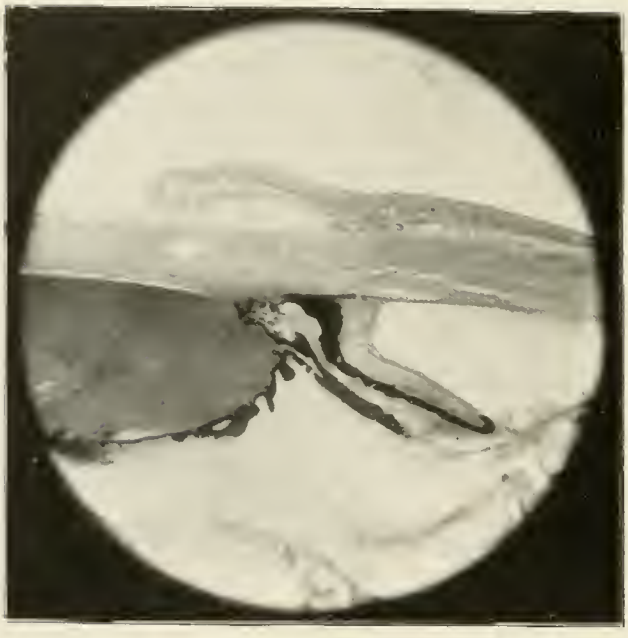

FIG. 2.

Section showing ciliary body full of sarcoma cells, peripheral adhesion of iris and infiltration of corneal layers. (x 15)

tective dressing, and has been kept clean by occasional spraying with bichloride solution. The orbital cavity has become partially filled with healthy, smooth, granulations, and no tendency to recurrence in the orbit has so far been noticed, although of course but a short time has elapsed since the operation.

I have asked my friend Dr. E. S. Thomson, one of the pathologists of the Manhattan Eye and Ear Hospital, to examine the specimen removed, and he has kindly given me a very complete report of his examination with two excellent photographs, one a micro-photograph, and the other of the gross specimen, showing very well the extent of the tumor. The following is his report:

Globe slightly enlarged. On section shows following points:—deep anterior chamber; beginning opacity of lens; inflammatory exudate around lens on all sides, especially near ciliary body; pupil widely dilated; iris adherent to cornea at periphery, blocking up filtration angle; vitreous chamber containing totally detached and degenerated retina, in which are numerous calcareous granules; choroid infiltrated with tumor mass as far forward as ciliary body, which is also infiltrated. The tumor mass is white, and is covered anteriorly by the choroidal pigment. It penetrates the sclera, which is much thinned, at the infero-temporal division of the posterior hemisphere. A large mass of tumor tissue lies outside of the globe. In places the tumor mass shows calcareous degeneration. The optic nerve is also involved in the tumor. (Fig. 1).

Microscopical examination shows the tumor to be composed of small round cells of young connective tissue type. There are numerous blood vessels with poorly developed walls running through the tumor. These round cells are present in almost all the tissues of the eye; the ciliary body is so entirely filled with them as to show no trace of its original structure; the ciliary anastomosis contains large numbers of round cells which entirely fill the canal of Schlem and run through the iris and cornea and into the episcleral tissues and conjunctiva. (Fig. 2).

The remains of the vitreous lie immediately behind the lens, and there masses of fibrin in the anterior chamber covering the iris.

The tumor springs from the choroid and is non-pigmented.

Diagnosis:—Small round cell sarcoma of the choroid.

Prognosis:—Absolutely bad.

The case I have made the subject of this article seems to me to emphasize the advantage, in some instances, of operating upon apparently desperate cases, even if the result should prove only palliative. The prognosis in my case is "absolutely bad" according to the report of my

friend Dr. Thomson, and I must admit the possibility, or even probability, of a recurrence of the malignant growth, if not in the orbit, then in some other part of the body. I hope such an unfortunate circumstance has been prevented by the very free removal of the contents of the orbit, but even if a recurrence in an inaccessible locality or in repeated instances should finally cause the death of my patient, I believe the primary operation to be abundantly justified by the history, since the boy is in comparatively good health at the present time and has had seven weeks of complete relief from the symptoms caused by the presence of such a large tumor. When the operation was performed the child seemed liable to die in a few days, and several of my associates doubted the advisability of an operation, from fear of a fatal termination at that time or soon after, hastened by the operation. By good fortune these fears proved groundless, and the child was distinctly benefited by the operation. How permanent the good results will be is still undecided.

252 Madison Avenue, New York.

ACUTE COLOR BLINDNESS.*

BY A. J. ERWIN, M.D.

Oculist to the Pennsylvania Company, Oculist to the U. S. Pension Bureau.

MANSFIELD, OHIO.

Color blindness, as a rule, is a congenital defect, which may be located in the optic nerve end organs, the photo-chemical substance of the retina, in the optic track, or in the cerebral cortex, but wherever it may be located, the microscope has not yet found for it a pathology, and its nature remains inscrutable, unless Donder's theory of the evolution in stages of the visual sense be true; he suggested that the lowest types of animal life may have only perception of light and shade, the next stage such vision as is had in red blindness, the next as in green blindness, a higher class with perfect vision with low chromatic sense, and finally normal vision in the perfect animal; and that the different forms of color blindness are simply retrogressions to one or other of these earlier types. But speculation of this kind has little weight in our day of material accuracy. Instead of having a theory now for every inscrutable condition as our fathers had, we have learned to say that we don't know the things that we have failed to find out. So I may truly and freely say

*Read before the Academy of Medicine, Mansfield, Ohio, October 31, 1898.

that we do not know the real nature of the lesion, or defect, which causes color blindness; not even in acquired color blindness—the special subject of this paper—have we any knowledge of its pathology. But it is not the purpose of this paper to enter upon the study of achromatopsia, but rather to give an account of two rare and interesting cases, the only cases of acute total color blindness that I have ever seen. They came to me within four days of each other, and were evidently the effect of the same cause. These patients lived on adjoining farms, but were not related.

Mabel G., age 13, and Bell S., age 14, consulted me first on January 10 and 14 respectively. Each had total color blindness of both eyes, extending over the entire fields; their acuity of vision and form sense were also somewhat reduced; they had photophobia and blepharospasm, the bulbar conjunctiva hyperemic, and the pupils myotic; their visual fields were from a third to a half reduced for white, tension and refraction normal; ophthalmoscopic examination showed slight congestion of the entire fundus, including the papilla, deeper about the fovea; the congestion of the discs was not sufficient to efface their margins, apparently only superficial, no turgescence of the vessels, the vitreous and other media were clear. In addition to these local conditions, Mabel had vertigo and nausea, Bell had severe headache and nausea. These systemic disturbances in each disappeared in three or four days. Each reported that her eyes had been sore for about three days before coming to me, the sight failing more each day. January 23 Mabel began to have slight perception of all colors in each eye, by the 28th her color sense had entirely recovered, but she had some dullness of sight, contraction of the fields, and asthenopia for a fortnight longer. Bell began to have peripheral color perception in her right eye by the 24th, and in the left eye by the 27th for all colors, but central color scotoma were several weeks in disappearing. They both returned to school about February 1st. They were able to read slowly during the whole term of their color blindness. They said the letters were as white as the paper, but still they could distinguish their forms. A shawl worn by Mabel was colored in white, black and red squares of an inch in diameter. They could see the squares, but all appeared white, and so with each of the colors; everything seemed white. The cause of these attacks of achromatopsia seemed to be exposure to the bright light of the sun on the snow. In other words, these seem to be peculiar cases of snow blindness. The girls were sure this was the cause of their color blindness. At the time the weather was dry and clear, and the sunlight very bright. The snow was covered by an icy crust, which made a very dazzling reflection. The girls walked a mile and a quarter

and a mile and a half respectively to school daily. Their hats gave no protection to the eyes, and they were of rather delicate constitutions and lightly clothed. I was quite convinced, in the absence of any other assignable cause, that they were cases of snow blindness, affecting especially the retina, and yet I have not been able to find any record of total color blindness from snow exposure; in fact, even partial achromatopsia is not a common symptom of snow blindness—the chief symptoms of which are corneal, conjunctival and retinal congestion, with resulting photophobia and ciliary pain, with some obtunding of the acuity of vision. Noyes, speaking of hemeralopia and snow blindness, says prolonged exposure to bright light will occasion torpor of the retina or the opposite state of exalted sensibility. Color sense and peripheral sight will be reduced in certain cases, but often not at all. "Snow blindness is a mixed condition, consisting of an intense photophobia, spasm of the lids, conjunctival and corneal irritation, the bright glare and severe cold combine to cause this condition." Wells, in speaking of snow blindness, says the impairment of vision is chiefly due to the diminution of the sensibility of the retina from the great and prolonged glare of the snow, but does not mention color blindness as a symptom; but in hemeralopia, a kindred condition caused by exposure to bright light, he says the power of distinguishing colors may be impaired. Förster, in the same relation, has seen cases in which white, yellow and green were more readily distinguished than blue, violet and red. Mittendorf speaks of partial color blindness in connection with disease of the optic nerve, but does not mention it as a symptom of snow blindness. Meyer says: "In almost all cases of optic atrophy the patient loses the power of distinguishing colors. This insensibility is first observed for the green, then for the red, next for the yellow, and finally for the blue." In speaking of retinal anæsthesia, he says: "It is characterized by diminution of central visual acuteness, the field is always abnormal and very much contracted, chromatic anomalies are never absent, sometimes the patient ceases to recognize some one or more colors, sometimes the color blindness is absolute." He further says, "Retinal anæsthesia almost exclusively affects women and children, generally persons who are anæmic, nervous, or hysterical, or who are convalescent from some serious disease," but he does not mention exposure to bright light as a cause of anæsthesia, nor does he speak of retinal anæsthesia as a factor in snow blindness, and yet his description of the symptoms of retinal anæsthesia tallies well with the condition of my patients. Fuchs speaks of "snow blindness as a keratoconjunctivitis with myosis," but does not mention disturbance of the

color sense as a symptom. He speaks of acquired color blindness as "due to disease of the retina, or optic nerve, or of the center for color sense in the occipital cortex." de Schweinitz gives about the same group of symptoms for snow blindness as Fuchs, and adds restriction of the visual field and hemeralopia, but does not speak of color blindness as a result. In his discussion of anæsthesia of the retina, which he believes to be only a part of a general neurosis, he makes mention of the contraction of the visual and color fields as characteristic symptoms, but does not speak of light dazzling as a cause. Thomson, in his article on color blindness in Norris and Oliver's System of diseases of the eye, remarks, "Acquired color blindness is frequently found in diseases of the optic nerve," and gives the procession of disappearance of the different colors in typical optic atrophy, and further remarks "that besides these chronic nervous diseases, acute infectious diseases like typhoid and typhus fevers, malaria and erysipelas may be followed by defects in color perception."

I have not taken the time to look up the literature of acute acquired colored blindness, but you will observe from the quotations that I have made from the leading authorities on eye diseases that they do not make mention of total acquired color blindness except in atrophy of the optic nerve, which is a permanent chronic condition. They concur in the opinion that anæsthesia of the retina is frequently accompanied by partial color blindness, and that anæsthesia of the retina may be caused by light dazzling, and they further agree that in snow blindness there is frequently anæsthesia of the retina, so by putting these conclusions together we have some authority for the opinion that snow blindness may cause color blindness by producing anæsthesia of the retina, which, I take it, was the condition in my cases. The rareness of acute total color blindness is shown in the fact that not one of the authorities cited contains a chapter or even paragraph directly on the subject, nor have I ever seen a case of acute acquired color blindness in my capacity as oculist to the Pennsylvania Company for the past thirteen years for all of its Ohio lines, requiring frequent examinations for color blindness of large numbers of men. My treatment in these cases was cold applications at first and later galvanism and strychnine.

CORNEAL ULCERS.

BY JOHN F. WOODWARD, M.D.

NORFOLK, VA.

In presenting the cases recorded below, I do not wish to open a discussion of corneal ulcers, whose etiology, pathology and symptoms are so well known, but simply to record several interesting cases, the treatment used in each, and the results.

Case 1. Mr. W., age 45, came to my office on March 15, 1898, having fallen over a chair, striking his left eye against the corner of a dry-goods box. His history was good, never having to consult a physician.

Status præsens: The blow was a glance one and did not break the skin, though the contusion was considerable, and the swelling was prompt. A drop of a 10 per cent. cocaine solution was followed by a douche of saturated sol. of boric acid, when I could see that the lower two-thirds of the superficial cornea was scraped off. I used a 10 per cent. orthorform salve and sealed the eye up. The pain was intense for a few minutes, and then he suffered no more until next day. He recovered rapidly and suffered no pain except a neuralgia about the left side of his face.

March 25 he had a severe attack of pain in the injured eye. I found the same raw surface as at first. The macerated epithelium was wiped off with a 1-4000 bichlorid sol., using holocain to prevent pain. He recovered promptly.

April 15 Mr. W. had another "break-down," as he called it. This time I scraped the surface under antiseptics, and in a week he was all right, with a smooth corneal surface.

May 2 he had a similar experience, and the pain was intense, radiating over the side of the face and to the back of neck. I used the cautery, and at no time did I destroy any of the corneal substance proper. The eye did well, and the salve controlled the pain.

June 1: He had begun to rejoice at his recovery, when the cornea sloughed again. This time I used subconjunctival injections of sodii chloride, and carbolic acid to the corneal ulcer. Atropia was put in the eye and pupil dilated *ad maximum*. I examined the nose and found that my patient had atrophic catarrh of twenty-five years' standing, and was now in a very bad condition. This I treated vigorously with much comfort to the patient. My patient did well and I did not see him until

about the first of July, when his cornea broke down worse than before, the conjunctiva chemotic, the lid swollen and the pain intense, radiating down the spinal cord. The superficial cornea formed over, the old ulcer peeled off and a real ulcer formed. Nothing seemed to relieve his pain, so I examined the border of the lower orbit, thinking that the blow might have compressed some of the bone, but found it all right. After two weeks it seemed to heal all right, and I did not see him until August 22, when the eye was worse than ever, and pain so intense that the patient was almost crazed. The T. was slightly increased, so I performed paracentesis several times, but with only temporary relief. He fell off from 175 to 165 and then to 150 pounds, and was a most pitiable nervous wreck. The ulcer would not heal under any treatment, although it did not spread, as the upper quadrant was clear. The pain was excruciating over left eye, back of neck and down the spine. I had had him on full doses of iodide potash and strychnia at different times, but he seemed hopelessly out of order, and the discomfort seemed all out of proportion to the size of the ulcer. He begged me to take the eye out, but I refused, until a few days later he took to bed and seemed to be an ill man, when I removed the eye at his earnest solicitation. He recovered promptly, after seven months of suffering.

Case 2. Major W., aged 54, came to see me in April, 1898, with a deep excavating marginal ulcer of left eye. I scraped the ulcer and used 1-1000 bichlor. to polish the scraped surface; gave salve of orthorform gr. 5, aristol, gr. 3; lanoline, 1 dram, and sealed up the eye. In a week he went home in good condition. In July he returned in as bad a condition as at first. This time I used the cautery and the same salve, and, contrary to custom, used atropine. I found that he had a bad case of hypertrophic nasal catarrh. This I treated regularly, and in two weeks the patient was well, and up to this time has had no more trouble.

Case 3. W. H., aged 50 years, came to me in August, 1898, with a cut across the cornea by a blade of fodder; the wound extended along the whole breadth of the cornea and to Descemet's membrane; pus had formed in the anterior chamber and he was suffering very much. I used a 1-5000 warm bichloride sol. to cleanse the wound and gave a 15 per cent. orthorform salve, including a small amount of iodol, and put on compress bandage. He suffered no more pain and has some sight, though a very dense scar.

Case 4. M. J., aged 24, came to me with a large central corneal ulcer which was giving him much pain; in fact, he left another oculist to consult me because he suffered so much pain. He had hypertrophic nasal

catarrh with profuse secretions. I scraped the ulcer, treated the catarrh, and used the same salve in his eye that I had used in the others. He suffered very little more from the pain, and in three weeks the eye had healed. In these cases I generally put on a compress bandage for at least four or five days.

These cases are not new, and the nasal catarrh feature has been recognized for several years, though probably not appreciated as it should be. Corneal ulcers are unsatisfactory to both the doctor and the patient; the results are uncertain and the treatment as variable as the nature of the different cases. Relief from pain and preservation of the corneal surface are the objects aimed at. In such cases *orthorform* seems to be worthy of our consideration, especially where the cornea has been scraped, or cauterized. Its combination with aristol, or iodol, gives an antiseptic salve, and the use of lanoline aids the gaining of its maximum anæsthetic property. Though the conjunctival surfaces are recognized as receptacles for bacteriæ, it is not enough to render them aseptic, as the septic condition made possible through the tear duct is now too well known to neglect this channel of infection. Also, if you render the patient comfortable you have gained much, as it is the discomfort that causes the patient to interfere, and reinfect the eye.

35 Granby Street.

THE DETECTION OF SIMULATED MONOCULAR BLINDNESS.

BY PERCY FRIDENBERG, M. D.

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In countries where obligatory military service or conscription forces all those capable of bearing arms into the ranks of a standing army, exaggeration of actual visual defect, or, more often, feigned loss of sight, has ever been a common means of attempted escape from irksome duty, and regimental surgeons and recruiting officers, rather than civilian physicians, had occasion to acquire experience by the great majority of these cases. "Such roguery," says Himly,[1] "you shall see most oft in young lads who perforce must serve with arms, soldiers ordered to the field of battle, idlers who fain would live at ease in spitals, and at times, too, in boys who shun school, and madcap girls constrained, beyond their liking, to knit and sew."

[1] Erkrankungen und Missbildungen, etc. Vol. I, p. 33.

Our political institutions and the social conditions of the country in which we live practically eliminate the classes mentioned from the scope of our consideration, and yet here, as well, we meet and must deal with deceivers and frauds not a few. Their ranks are recruited, in this era of mental stress, by the degenerate, the hysterical, the neurasthenic, and the sufferers from some one of the group of traumatic neuroses, whose claims of recompense for damages or of insurance money, after accidents, are fruitful sources of litigation. The ophthalmologist whose services as an expert are retained in such a suit at law has at the same time a grave responsibility and a great opportunity, for his skillful use of methods of examination and the questions suggested by his special knowledge may unmask and bring to justice a cunning impostor, or again, surely no less gratifying a consummation, clear from suspicion and fortify in his just demands the victim of accident or of intentional violence. The task set is frequently a difficult one; the circumstances unfavorable to calm and exact observation, as the examiner is himself to a certain extent, as it were, on trial, and liable at any moment to be interrupted, or to have all advance barred by objections, should his methods, however correct technically, seem even to trespass upon the rights of the subject, so carefully safe-guarded by the rules of civil procedure, so jealously watched over by his legal adviser.

Nor is the mental attitude of the subject, mistrustful, antagonistic, perhaps even doggedly perverse, or worse still, forewarned and schooled for such tests as he may be expected to undergo, calculated to aid in eliciting the truth; while on the other hand, an impulsively and gratuitously corroborative witness may cloud the clearest proof with the suspicion of pre-arrangement. In forensic practice, too, our choice of a simulation-test is further limited by the all-important consideration that we must not only satisfy ourselves, but convince others, and demonstrate by the statements evoked from the witness, the actual condition of affairs. Ophthalmoscopic examination, pupillary tests, the use of mydriatics and determination of refraction, must in most cases be eliminated, some on account of technical difficulties, others for reason of jurisprudence. Still we shall find that among the many tests devised, one or the other will in the end lead us to our goal, and that no deception, however skillful, can prevail against the thoroughly prepared ophthalmologist who has mastered the subject and learned how easily and rapidly the procedures may be varied and modified to meet not only the requirements of different cases, but the exigencies of the moment in the individual case as well.

In almost all instances the claim of monocular amblyopia only is

made, as this condition is more easily feigned than loss or deterioration of vision in both eyes. The great majority of detection-tests aim at producing an admission of binocular vision, or a physiological act inseparable from it; the former without the subject's knowledge, the latter independent of his will. The basis of such tests is the fact that we do not analyze visual impressions in such a way as to recognize, at once, which eye is the perceiving one, and further, that we are unaware of, or habitually overlook the fact that we receive two images of each object, which, falling on corresponding points in the retina of either eye, are translated, in cerebro, into their real significance. If the light rays entering one eye are deflected from their course, so that the images of the object now occupy non-corresponding retinal points, they will no longer be fused in our consciousness, but will produce diplopia. The use of prisms in the detection of simulation rests upon this presumption of binocular vision, and upon the hope of an admission of seeing double images by the subject. Originally suggested by Von Graefe, in 1865, it was found, scarcely two years later, that simulants had become conversant with it, and denied that they saw double. To meet this the test was modified so that the edge of the prism bisected the pupil of the supposedly normal eye, allowing some rays to enter unaffected, and deflecting others, so as to produce monocular diplopia, to accustom the subject to double images. This preliminary exercise having been completed, the simulating eye is, as if by accident, uncovered, while, by the very slightest motion, the prism in front of the other is displaced so as to cover the entire pupillary space. If diplopia is still present it is, of course, binocular. Not infrequently, however, simulants will consistently deny the perception of double images, so that the prism test proves only their disingenuousness without actually demonstrating binocular vision. The test may also be vitiated by the difficulty of bisecting with the prism edge an unusually small pupil, especially if the subject, intentionally or otherwise, moves his eye, or the examiner's hand be at all unsteady. To obviate this difficulty Froehlich[1] employed a prism of Iceland-spar, which in all positions produces a double image, while Monoyer and others have ingeniously combined prisms so as to allow monocular triplopia, or still greater complexity.

This method is, however, not well adapted to public demonstration, and the apparatus not easily obtainable at short notice. Priestley Smith advises the use of a prism, the deflecting action of which will be overcome, in the interest of single vision, by an automatic movement of the

[1] Zehenders Klin. Monatshl., '95, p. 263.

eye. If there is good vision, the eye will be seen to move back and forth, as the prism is alternately placed over it, or withdrawn. In such a case no statements are required, and we are made independent of the subject. It is stated, however, that the test is not infallible, as correcting movements are occasionally observed even in amblyopic eyes in which sight has been impaired but a short time, while its chief applicability is found only where the claim of total blindness is made.

The same principles of binocular vision suggested the use of a stereoscopic test, producing by fusion of two different images a composite picture, or inducing so-called "stereoscopic lustre" by combination of similar images, one white, the other black. It was soon noticed, however, that a simulant could, by rapidly closing and opening the eye, refer each image to its real source, and thus gain a clue to a system of consistency in prevarication, while the winking itself, however suspicious, afforded no proof of the ocular condition. To nullify the result of such a ruse, instantaneous momentary illumination was suggested by Rabl-Rückhart, while the same object was accomplished, more simply, by Volkmann, in whose Tachistoskop the test-object is concealed or revealed by the rapid motion of a sliding spring shutter, allowing no time for winking or deliberation.

Confusion of the image source is the foundation of the "blurring test," in which a strong convex glass is placed before the admittedly sound eye, and the subject made to read. The test-type is afterward withdrawn beyond the focal distance of the lens, where, if read at all, it must be by means of the other eye, alleged to be blind or amblyopic. Variations in the practical application of this procedure will suggest themselves at once, having as their object to allay the suspicions of the subject, and to avoid any manœuvre which shall give a clue to the nature of the test. Adler[1] applies it to the quantitative determination of distant vision, substituting Snellen's optotypes at five or six meters for the Jaeger print, and arranging the letters in irregular sizes with frequent variation (change—and confusion—tests). Snellen's test, one of the most ingenious of all, depends on the transmission by stained glass of rays of like color, and the absorption of all others. Transparent red and green letters can be seen through red and green glasses respectively, while the first are invisible to the eye covered by green glass, the latter to that beneath the red. This test is perfect in itself, and leaves little to be desired. As a further safeguard in cases where circumstances make it necessary to confound a more than usually shrewd malingerer, Minor[2] devised the

[1] Bericht, 25 Vers. d. Ophth. Jeseelsch. Heidelberg, p. 325.
[2] Archives of Ophthalm. Vol. XXII, p. 493.

opposite or negative of this picture by substituting opaque colored letters and reflected light with a suitably colored background. French gray was found to give the best results, as, with this modification, red letters could be seen through the green glass only, and vice versa. The gray background appeared to have the color of the glass through which it was observed, so that a letter of the same color offered no contrast, as the outlines of a red object on a red ground, for instance, would not appear. A combination of this modification with the original test was made by using a gray painted glass with some letters transparent and others painted red and green, to be viewed by transmitted or by reflected light. A slight objection to this, as to the original Snellen test, is the possibility that the subject, by winking, may inform himself as to which eye he uses to see the different letters, and, as both eyes are covered by deeply colored glasses, he may easily escape detection. For this reason it is advisable to arrange for only momentary exposure of the test-card, or to adopt a modification which suggested itself to me while making some experiments with the different methods, and which allows constant supervision of the simulating eye. Over the other eye only I place a colored glass, using as test objects opaque red and green letters on a dull black background to be viewed by reflected light. With this arrangement red letters are seen through red glass only, while green letters merge into the black field and are invisible. The subject cannot blink without attracting instant attention, and eliciting an admonition to keep both eyes open, and closure of the sound eye under the glass will teach him nothing. Substitution of a gray background gives us an adaptation of Minor's "negative" Snellen-test, and adds to the possibility of variation.

In conclusion I wish to suggest a test which has the great advantages of requiring no special apparatus, of being easily demonstrable, and of offering no clue to the malingerer, while it enables us to make a quantitative determination of visual acuity. A small test card[1] and a concave mirror, the ordinary laryngoscopic head-mirror, are all that is required. A concave reflecting surface of this kind produces a magnified, virtual image of an object held within its radius of curvature, which by proper management can be made to fall on one or the other retina, or on both. Experiment has shown me that it is impossible to say with which eye the mirrored image is seen, until the fact is demonstrated by alternate exclusion of both eyes from the visual act. In fact the eye which is not called into play is the one we believe to be active. In practice the test is made while standing in front of the subject and somewhat to the side of the

[1] As the mirror reverses the letters, they must be written backward, or face both ways, as O, T, V, etc.

admittedly sound eye, the mirror being worn as for laryngoscopic examination. The subject will now see the reflection of this eye only, and the image of the test-card which is placed a few inches from his temple, on the corresponding side. If the card, while in this position, is read, it must be by calling into play the other eye, the reflection of which the malingerer does not even see, and whose action is demonstrated by having him close it. He will then be convinced, by seeing nothing, that the sound eye which he believed he was using, was in no way concerned in the visual act.

As a control test, before demonstration, the mirror and the card are held on the side of the simulating eye, and, as before, the reflecting glass is slightly tilted on its vertical axis so that the card and this eye only are seen by the subject, who naturally thinks that the mirrored eye is the one which receives the visual impression, whereas in fact it is seen by the sound eye, which is nowhere visible. If it is now stated, as will natually be the case, that the image can not be seen, deliberate falsehood, at least, is made evident. The test may be varied by very slightly altering the tilt of the mirror, so that reversed conditions are produced and the sound eye only sees the card and its own reflection when they are on its side, and vice versa. For successful practical application the card should not be too large, at best not larger than the mirror, and a little previous practice may be required to insure rapid and accurate adjustment of the latter. In this manipulation we are aided by the position of the reflected image of the test-card on the subject's cornea or sclera. To insure absolute correctness of the optical conditions, however, it may be well to have both card and mirror mounted in a light frame.

CYLINDRICAL TRANSPOSITION.

BY NORBURNE B. JENKINS, M.D.

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The transposition of cylindrical lenses has been for years one of the most intricate problems in the science of optics. It has engaged the attention and taxed the skill of all interested in the properties of lenses. Heretofore there has been no well-defined rule of solution. The various and complex theorems proposed are as numerous as the optical mathematicians, each of whom presents some combination of abstruse principles, the explanation of which is understood only by the exponent himself.

The propositions as stated below involve only a limited knowledge of addition and subtraction, and almost reduce cylindrical transposition to an axiom.

A convex cylindrical lens of a given focal distance, say one meter, and of a given axis, say 90°, is the equivalent in refractive power of a sphero-cylindrical lens composed of a convex spherical lens of an equal focal distance, one meter, combined with a concave cylindrical lens of the same focal distance, one meter, but with the axis at a right angle, 180°, to that of the original convex cylindrical lens. (See example No. 1.)

A concave cylindrical lens of a given focal distance, say one-half meter, and for a given axis, say 180°, is the equivalent in refractive power of a sphero-cylindrical lens composed of a concave spherical lens of an equal focal distance, one-half meter, combined with a convex cylindrical lens of the same focal distance one-half meter, but with the axis at a right angle, 90°, to that of the original concave cylindrical lens. (See example No. II.)

One component cylindrical lens of any given combination should be converted into a sphero-cylindrical lens, and the computation is based upon this result.

The following examples illustrate the transposition of combined and compound lenses:

No. I.—A convex cylindrical lens: + 1.00 C. axis 90° ⊂ 0.0 is equal to + 1.00 S. ⊂ −1.00 C. axis 180°.

No. II.—A concave cylindrical lens: −2.00 C. axis 180° ⊂ 0.0 is equal to + 2.00 C. axis 90° ⊂ −2.00 S.

No. III.—A crossed cylindrical lens: + 1.37 C. axis 82° ⊂ −1.75 C. axis 172° is equal to + 1.37 S., −1.37 C. axis 172° and −1.75 C. axis 172°, which equal + 1.37 S. ⊂ −3.12 C. axis 172°.

No. IV.—A convexo-convex sphero-cylindrical lens: + 2.25 S. ⊂ + 1.62 C. axis 88° is equal to + 2.25 S., + 1.62 S. and −1.62 C. axis 178°, which equal + 3.87 S. ⊂ −1.62 C. axis 178°.

No. V.—A convexo-concave sphero-cylindrical lens: + 3.50 S. ⊂ −1.25 C. axis 165° is equal to + 3.50 S., −1.25 S. and + 1.25 C. axis 75°, which equal + 2.25 S. ⊂ + 1.25 C. axis 75°.

No. VI.—A concavo-concave sphero-cylindrical lens: −3.00 S. ⊂ −1.50 C. axis 77° is equal to −3.00 S., −1.50 S. and + 1.50 C. axis 167°, which equal −4.50 S. ⊂ + 1.50 C. axis 167°.

No. VII.—A "mixed" sphero-cylindrical lens: + 2.12 S. ⊂ −3.37 C. axis 60° is equal to + 2.12 S., −3.37 S. and + 3.37 C. axis 150°, which equal −1.25 S. ⊂ + 3.37 C. axis 150°.

No. VIII.—A sphero-cylindrical meniscoid lens: −2.00 S.⊃+ 3.25 S compounded with + 1.50 C. axis 75° is equal to −2.00 S., + 3.25 S., + 1.50 S. and −1.50 C. axis 165°, which equal + 2.75 S.⊃−1.50 C. axis 165°.

No. IX.—A sphero-crossed cylindrical lens: + 5.00 S. compounded with + 2.00 C. axis 85°⊃−6.00 C. axis 175° is equal to + 5.00 S., + 2.00 S., −2.00 C. axis 175° and −6.00 C. axis 175°, which equal + 7.00 S.⊃−8.00 C. axis 175°.

No. X.—A quadro-meniscoid lens: + 3.25 S. compounded with + 2.00 C. axis 65°⊃−2.25 S. compounded with −1.75 C. axis 155° is equal to + 3.25 S., + 2.00 S., −2.00 C. axis 155°, −2.25 S. and −1.75 C. axis 155°, which equal + 3.00 S.⊃−3.75 C. axis 155°.

THE PRESENT STATUS OF REFRACTION.

BY RICHARD H. SATTERLEE, M.D.

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BUFFALO. N. Y.

Anent the threatened passing of the oculist and the substitution of the "ophthalmo-optician," "Doctor of Refraction," et al., would it not be advisable to inquire into the cause of this state of affairs?

1. Many brilliant operators look upon refraction as a momentary pastime or a nuisance to be quickly gotten rid of, hence the unsatisfactory result.

2. Many conscientious men have not the time to devote to any one patient to properly determine the refractive trouble.

3. The average ophthalmologist writes a prescription for the glasses.

If our work is all that can be desired why are there two thousand refracting opticians in New York state, and schools all over the country turning out hundreds of "graduate opticians" who fit the frames perfectly and (sometimes) the lenses?

What is the remedy? In the first and second class the refractive work should be referred to some one who can take the time, take the interest, has the knowledge and sees that the case is properly fitted in every particular.

The advantage that these opticians have is that they take the time and *furnish the glasses.* If you will watch your own prescription work that you send to the optician you will find 25 per cent. is improperly filled. The lenses are wrong, the P. D. is wrong, the centering of the

lens is wrong, the height of the bridge is wrong, the nose piece—if eye glasses—is not adapted to this particular nose, etc., etc. Any one of the errors mentioned may cause your work to be unsatisfactory and a detriment to your reputation. Can you afford it? Should your responsibility end with writing the prescription? I think not. I have furnished glasses for eight years and I never write a prescription without misgivings unless I can later observe by inspection the way it has been filled.

I heard one eminent ophthalmologist say that he generally prescribed a minus or plus lens, whichever seemed the more agreeable to the patient. It is this absolute indifference to the correct diagnosis that has done the most to encourage jewelers and others to take up refraction.

Some men prefer operating to refractive work, others prefer refraction. It seems strange to me that so few partnerships of this sort have ever been formed. We have all seen cataract cases that were not refracted so as to bring out the best sight.

Many physicians are sending direct to opticians rather than subject their patients to a hasty and superficial examination. Let us revise our methods. Utilizing the best methods of opposition is better than any legislation striving to control competition.

187 Delaware Avenue.

A NOTE ON TOXIC CHROMATOPSIA AND TOXIC HYSTERIA.*

BY G. E. DE SCHWEINITZ, A.M., M.D.,
PHILADELPHIA.

Colored vision as a symptom of santonin poisoning is well known; more rarely it develops under the influence of nitrite of amyl, picric acid, chromic acid, digitalis and carbonic acid. According to Simi, it may be associated also with tobacco-alcohol amblyopia. In his case the xanthopia lasted from twilight to sunrise, and it and the other symptoms were cured by total abstinence from tobacco and alcohol. I have never observed this symptom in toxic amblyopia until recently, and I desire to present for your consideration an account of the case:

Mr. S. T. B., a retired merchant, born in this country, presented himself for treatment on the 30th of August, 1898.

History.—The patient is married, has healthy children and grandchildren, and gives no account of specific infection. Two years ago, following an attack

* Read before the Ophthalmic Section of the *College of Physicians of Philadelphia*, November 15, 1898.

of influenza or malaria (it is uncertain which), he developed gastro-intestinal catarrh, attended with a great deal of flatulency and nervous weakness. Dr. Da Costa, his physician at that time, informs me that the urine contained an excess of uric acid, but neither albumin nor sugar; also, there was no ocular disturbance, at least none was spoken of. This catarrh still gives him some pain and concern, but he appears cheerful, sleeps well, and has no business worries. There is a history of a fall on his back from a coach, but no present traces of injury. From the time he was eighteen years old he has smoked freely, never less than six or seven cigars a day, but he has never used intoxicating drinks, not even beer. For a number of years he also chewed tobacco, but he has discontinued this habit since 1874. Occasionally at night, by direction of his doctor, he has taken a tablespoonful of hot whisky to relieve stomachic pain. This dose, however, has been of rare occurrence.

He first observed "poor vision" in his left eye in 1864, and from his account one would suppose that the visual defect should be classified as a congenital amblyopia. Decided visual disturbance began in the left eye, he maintains, eleven years ago, when it was inflamed, and after this inflammation had passed away his sight was even more defective than formerly. The doctor who attended him at that time, but who has kept no notes of his case, writes that the inflammation was an iritis; but there are no remains of this disease to be found in the eye.

The right eye, the patient asserts, performed its functions well and usefully until eight weeks before he consulted me; or, in other words, until the first part of June, 1898, when he was attracted by a phenomenon which resembled smoke before his eyes; at first bluish, but soon changing to a yellow or orange-yellow color, which he compared to the smoke rising from the chimneys of the zinc works in the town in which he lived. This smoke is of a rich orange-yellow color.

Examination.—In the right eye V. = 6/15 + 4.50 M. = 1 at 25 cm. The pupil reactions are normal; the media are clear; the optic disc is round and slightly congested, with the exception of a small quadrant on the temporal side, which is somewhat paler than the rest of the surface; the central lymph sheaths are full, the veins and arteries about normal in size and there are no macular changes.

In the left eye V. = sees hand move. The pupil reactions are normal; the media are clear; the disc is slightly more flushed than the one upon the opposite side but contains no patch of pallor. In other respects the ophthalmoscopic appearances are similar to those of the right side.

The urinary analysis was as follows:

No. 1.

Color ---------- amber.	Micrococci ureae.
Reaction ---------- acid.	Bacterium termo.
Sp. gravity ---------- 1022.	Crystals of phosphates.
Albumin ---------- none.	Epithelial cells, some of which are granular.
Sugar ---------- none.	
Urea ---------- grs. 9.10 to ℥ i.	One epithelial cast.
Chlorides ---------- normal.	
Phosphates ---------- excess.	

No. 2.

Color----------amber.	Micrococci ureae.
Reaction ----------alkaline.	Bacterium termo.
Sp. gravity----------1017.	Crystals of triple phosphates.
Albumin ----------none.	Epithelial cells.
Sugar ----------none.	No casts.
Urea ----------grs. 8.64 to ʒi.	
Chlorides ---- -------normal.	
Phosphates----------excess.	

The peripheral visual field of the right eye was not far from normal and the color fields occurred in their normal sequence, perhaps slightly contracted. There was a typical central scotoma for red and green, capped by an area of imperfect color perception. Its dimensions were: outward, 20°; upward, 7°; inward, 3°; downward, 5°.

In the left eye the peripheral light field, taken with a small flame, was perfectly normal. Perception of any color was denied, although the difference between a white and a black test-object could be noted, except in the central area of the field where the white test-object disappeared absolutely within the area of a scotoma which was sharply outlined as follows: Outward, 18°; upward, 9°; inward, 3°; downward, 4°.

The diagnosis of amblyopia due to tobacco acting as a poison on a man whose system was depressed by gastro-intestinal catarrh seemed clear enough, and the patient was advised to discontinue smoking absolutely and to take for a time iodide of potassium and bichloride of mercury and later strychine.

The patient returned on the 21st of October, 1898, or nearly two months later, with the statement that he was considerably better. He confessed that occasionally he had lighted a cigar and taken "a few whiffs," but maintained that this practice occurred only once or twice a week. The vision of the right eye was now 6/10 and moderate sized print could be read easily with a + 3 D.; that of the left eye remained unchanged. The yellow vision, although still present, had become very faint. No attempt was made to map the scotomas at this examination. The treatment was continued and the patient directed to abstain entirely from tobacco.

He returned two weeks later with the statement that his vision had much improved, that the chromatopsia had practically disappeared and in its place there was only a slight shimmering in the atmosphere, as when waves of heat pass through the air. In the former scotoma-area of the right visual field there was restoration of the red-green sense, except at the culmination spot of the scotoma where red looked "yellowish" and green "of a lighter color." Vision with + 0.50 D. was 6/6, and with proper presbyopic correction added, J. 1 was read at 33 cm. There was no change in the appearance or apparently in the vision of the left eye, with which the patient maintained he saw nothing but shadows.

A careful series of tests was then made with the ordinary methods for detecting feigned monocular blindness and the patient promptly responded to each one of them. With Harlan's test it was readily demonstrated that he saw with his left eye just as well as he did with his right, reading exactly the same letters. The ease with which this demonstration was made so astonished me that I

repeated it over and over again, modifying it in various ways, always with the same result.

The left side of the face, certainly the left side of the forehead, while not absolutely anesthetic, showed diminished sensation. Anesthesia of the entire half of the body, however, could not be demonstrated. There were no particular changes in the knee-jerks, the station was not anomalous, nor were there noticeable fibrillary contractions.

In this interesting case there appears to be an association between toxaemia and hysteria. It is well known that the so-called hysterical lead paralysis is common enough in lead factories, its subjects being affected with hemianesthesia, amblyopia on the same side, anosmia on the opposite side, dyschromatopsia and reversal in the color lines. Goinou, who has made a very good study of these cases, thinks that many other toxic agents can originate an hysterical condition, for example, alcohol, mercury, bisulphide of carbon and probably nitrobenzol, and that the patients will suffer from hemianesthesia, restriction of the visual field and similar conditions, and can be cured by remedies of indifferent potency, or even by suggestion. I know of no reason why tobacco should not be added to this list. I regret to say that I did not try the effect of suggestion or indifferent remedies, but gave very honest doses of iodide of potassium, bichloride of mercury and strychnia, as I did not in the least suspect either an hysterical element, or that the blindness was feigned, before the tests to detect pretended amblyopia were made.

It is interesting to observe that, if the patient's clinical history is correct, apparently he has disassociated the left eye from the visual act for at least eleven years, because one would hardly credit this patient with malingering; indeed, there is nothing to render such a course on his part necessary, either now or in times past, and although the fact that he saw with the left eye was developed by the ordinary tests for feigned blindness, they do not necessarily mean that the blindness was feigned. It is probable in these cases, as has been pointed out, that the subject really sees, but that the impulses coming from the periphery are not properly recorded until something takes place which places the burden of the visual act upon the supposed blind eye. Be this as it may, the record of the case seemed worthy as an interesting clinical observation, not only on account of the association of what may be called hysteric and toxic elements, but chiefly on account of the very rare phenomenon of colored-vision under these circumstances. It goes without saying that no question suggested to this patient to describe colored-vision. It was for this that he sought advice and his descriptions were given without the slightest prompting.

VISION OF RIGHT EYE DESTROYED BY THE KICK OF A HORSE ON RIGHT SUPRA-ORBITAL RIDGE AND RIGHT CHEEK.*

BY WILLIAM C. BANE, M.D.

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DENVER, COLO.

Illustrated.

I submit the following report, as such cases are rather rare. It is of interest because the man escaped with his life, and the subsequent changes in the right disc confirmed the diagnosis and prognosis.

On September 14th, 1897, I was requested by Dr. J. N. Hall to see D. R. D., aged 44 years, a Scotchman; occupation that of a stone mason.

I found the man at his home, sitting in a darkened room with a bandage covering his right eye. He gave the following history: Five days previous, between five and six o'clock in the afternoon, he was out riding in a buggy with a fellow workman, and by some mismanagement he was pitched from the conveyance. He fell near the horse and was kicked in the face by the animal. For about eleven hours he was unconscious, during which time he was conveyed to the County Hospital, where his wounds were dressed. On the morning of the third day after the accident he discovered that he had bare light perception with his right eye. An examination revealed a lacerated wound an inch and a half in length, extending down to the bone through the brow, immediately over the supra-orbital ridge. (See drawing, made after the wound had healed.) The tissues covering the right malar bone were swollen and discolored. There was some irregular cuts in the right upper lip. In the tissues of the lower outer quadrant of each eye slight ecchymosis existed. The action of the external ocular muscles was normal. Vision of right eye was nil, not having light perception. Vision of left eye = 6/6. Fields of left eye normal for white. Pupils were equal. The pupillary reflex of the right eye was absent, the associated reflex of the right pupil with that of the left was normal. The mediæ were clear and the fundi of normal

*Read before the *Denver and Arapahoe Co. Med. Soc.*, Nov. 9th, 1898.

appearance, there being no change in the discs or vessels from the normal. The day previous to my first visit he had a moderate headache. His appetite was fair, pulse was 90 and temperature $99\frac{6}{10}$ths at 6 P.M. Prognosis as to vision of right eye was unpromising, as it seemed evident that he had sustained a fracture of the right optic canal, with injury to the nerve. Patient was placed upon iodid of potass. in five grain doses four times daily.

On September 17th the eyes were re-examined, but no manifest change had taken place in either eye. On October 4th, 1897, twenty-five days after the accident, patient complained of having noticed at times during the previous five or six days, a shadow come over the vision of his left eye, yet there was no manifest change in vision, the right being nil

and the left 6/6, and the discs remained normal in appearance. Some soreness existed at the junction of the right nasal with the frontal and superior maxillary bones. Hearing, right ear equaled watch on firm contact. Left ear, not on contact. Patient stated that he had not been able to hear his watch with his left ear during the past ten or twelve years. He heard the ordinary tone of voice with either ear. The patient passed from under care in October, 1897.

On the 13th of October, 1898, I inquired for the patient, that I might know what changes had taken place in his eyes, and learned that he had recently placed himself under the care of Dr. Coover, in the Dispensary of the Gross Medical College. To Dr. Coover I am indebted for the following statement of the case: "Right eye, no light perception, pupillary reflex is absent, blue white atrophy of right disc, absence of its capillary vessels and slight narrowing of the retinal arteries. Left eye

vision = 6/6, disc appears normal." This evening—November 9th, 1898—it was my privilege to examine the man's eyes and I found them as reported.

Dr. Von Hölder,* a pathologist, during a period of forty years, examined 124 cases of fracture of the skull. In 86 there was fracture of the base of the skull, and in 79 of them the fracture extended into the orbital roof. In 63 of the 86 he found a fracture through the optic canal, always through the upper wall and sometimes through the inner; occasionally on both sides. In 42 of the cases there was hemorrhage into the sheath of the nerve. Gower† states that "*fracture of the skull* not uncommonly causes loss of sight in consequence of laceration of the optic nerve. The most frequent causes are blows and falls on the frontal bone, (especially the orbital portion), less frequently on the temporal or occipital bone. The effect of the resulting laceration of the nerve is usually immediate and permanent loss of sight. It is generally unilateral and on the side of the injury, rarely on the opposite. The lesion is commonly behind the entrance of the central vessels, hence at first there is no ophthalmic changes or only transient retinal hyperemia, but atrophy gradually sets in. The ultimate appearance of the disc is usually simple atrophy, the edges being sharp and the vessels of normal size."

At the time of the accident there evidently occurred fracture of the orbit or bony canal through which the right optic nerve passes and with it loss of function of the nerve, either from laceration of the nerve, hemorrhage into its sheath or both.

Steele Block, 16th and Stout Streets.

HERNIA OF THE SCLEROTIC.

BY S. B. MUNCASTER, M.D.

WASHINGTON, D. C.

Illustrated.

A patient came from Alexandria, Va., to the Woman's Dispensary with the following history: She could only see to move around in her home; the left eye was operated upon in Baltimore about two years ago, and she was not able to see much some time before the operation.

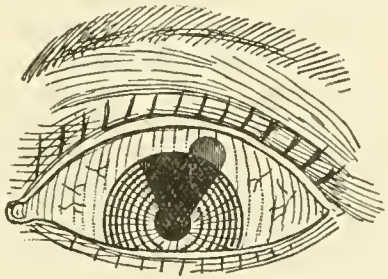
Upon examination I found a hernia of the sclerotic of the left eye. The sclerotic of the upper and outer quadrant was bulged 4 mm. from the normal rotundity of the eyeball, and was 4 mm. in diameter at the base.

* Noyes on *Diseases of the Eye*, 2d. Ed., page 685.
† *Medical Ophthalmoscopy*, 3d Ed., page 185.

The raised portion of the membrane was so thin that I was afraid to put much pressure on it to force the membrane down. The membrane was almost transparent; so much so that the outlines of some of the retinal vessels could readily be discerned.

An iridectomy had been performed, and a large section of the iris removed. The sclerotic was separated from the ciliary region at this point forming a canal from the anterior chamber to the hernia where the aqueous fluid passed. A thin membrane separated the aqueous from the vitreous humor.

On close observation a dislocated opaque oscillating lens was seen to the right of the anterior chamber. An incision had been made in the cornea; no doubt for a cataract extraction.



This hernia is of interest on account of there not being any inflammatory condition of the sclerotic; the complete opening that can be seen leading from the anterior chamber to the hernia; how thin a sclerotic membrane may be stretched without a rupture, and the amount of aqueous fluid it contains.

She can count fingers at three feet with the left eye. The right eye has a complete cataract, and on examination of this eye in a dark room by aid of a candle light, I found she could not even perceive light.

I advised a slight pressure bandage for left eye, and boracic acid solution for the lids.

MUSCULAR ANOMALIES.

BY G. C. SAVAGE, M.D.

NASHVILLE, TENN.

To know ocular muscle anomalies and what to do for them, one must first know the normalities of these muscles. The best way to study the extrinsic ocular muscles is from the point of view of their final action, or rather the final result of their action, errors having been corrected by antagonizing muscles. In their final action the recti are concerned alone with the visual axes, the superior and inferior recti always keeping these

lines in the plane which passes through the center of rotation and the macula of each eye, except when there is decentration of one macula, or of both in opposite directions, vertically; while the lateral recti make these axes intersect at the point of binocular fixation. The oblique muscles, in the final result of their action, are concerned alone with the vertical corneo-retinal meridians, keeping the planes of the meridians, in which are found the vertical axes of the eyes, so related that these axes shall always be parallel, except in oblique astigmatism. The torsional effect of the recti, when in action, and oblique astigmatism, alone make it necessary that there shall be oblique muscles.

The head must be in the primary position and the eyes looking straight ahead into infinity, for the normal *rest-tension* of the eye muscles to manifest itself; and then only when the different pairs are perfectly balanced in their power *to rest* as well as *to act*. In any other position of head or eyes two of the three pairs will always be guilty of errors in action, and the third pair (the lateral recti) cannot act faultlessly if attached, in greater part, either above or below the horizontal plane of the eyes; but these errors are not classed as heterophoric, for, with only normal effort, the error in action of one pair of muscles is corrected by one or both of the other two pairs. So easily and quickly are such errors corrected, no test will ever be invented that can detect them. Such a condition is orthophoria—correct final result in action of all the extrinsic ocular muscles. In such eyes we know one muscle capable of sinning against another muscle only because of our knowledge of the origin, course and attachment of these muscles, and of the center of rotation. Any variation from the condition just described is heterophoria — muscle imbalance — errors that are as common as focal errors, fully as annoying to the patient and more difficult of detection and correction by the Doctor. The varieties of heterophoria are: Esophoria, exophoria, hyperphoria, cataphoria and cyclophoria, together with their varying combinations, for two or more of these errors may co-exist in any case. In degree, heterophoria may be anywhere between orthophoria and heterotropia, from a small part of one degree to many degrees. As in ametropia so in heterophoria, the patient with the greatest error does not always suffer the most. Even very small errors often give the greatest amount of trouble. In dealing with heterophoric conditions the question is not so much, what is the kind and quantity of the error or errors? But what is the patient's ability to correct the same? Can the strain be borne without exciting nervous phenomena? Or are there reflex nervous symptoms brought on by the near use of the eyes?

There are many devices for determining the condition of the ocular muscles. Hardy & Co., of Chicago, are now perfecting a phorometer which, being constructed on what appears to be the correct principle, should be entirely trustworthy. With this instrument only one eye is under test at a time. Both the displacing prism and the rotary prisms are before the eye under test. The head must be in the primary position; the eye not under test must be directed straight ahead and the test object seen by it must be the one "fixed." The image of the test object must be displaced, in the eye under test, entirely beyond the field of binocular fixation. This eye, not being able to fuse its image with that of the other eye, being wholly from under the control of the guiding sensation, places itself at once in position, normal or abnormal, of equal tension of all the extrinsic ocular muscles. The relationship that the false image bears to the true, shows at once the kind of error, if any, while the rotary prisms determine the quantity. All of the muscles of this eye having been tested for heterophoria, the instrument is brought before the other eye and the tests of its muscles are made. In all these tests the real object is the one looked at, while the head is continually in the primary position.

The work of testing the ocular muscles is not complete when the imbalance has been determined, but the "lifting power" of the muscles must be ascertained before one can know what should be done in any given case. The instrument referred to above is capable of making the strength tests of all the extrinsic muscles except that of the obliques. The response of perfect muscles should be: adduction, 30° to 40° (always variable); abduction, 8°; subduction,* 3°; superduction,* 3°.

Orthophoria.—There are two kinds: sthenic and asthenic. In the former, the phorometer shows, both in the far and the near, perfect balance of each pair, and also shows the lifting power of each muscle to equal or exceed the standard. These muscles need be given no further attention. The other form, asthenic orthophoria, responds like the former to the balance test, the false object always bearing the proper relationship to the true; but the strength test shows that both muscles of one or more pairs, for each eye, are wanting in power. The lateral recti alone may be at fault, abduction being 4°, a little more or a little less, and adduction necessarily correspondingly low. Such a condition is not desirable and should be remedied by a daily resort to the wall-to-wall exercise, which, in time, will bring the muscles up to the normal lifting power.

*These terms were suggested by Maddox and should be adopted in the place of deorsum—and sursum-duction.

The error may be alone in the vertical pair, subduction and superduction being 1½°, a little more or less. This can be remedied by daily ceiling-to-floor exercise. When the weakness is in both the lateral and vertical pairs of muscles, the remedy is in the combined wall-to-wall and ceiling-to-floor exercise. In both of these exercises the sweep should be made rhythmically, the movements alternating about every three seconds.

Esophoria.—There are two kinds, pseudo and intrinsic (false and true). Pseudo-esophoria is caused by the effort of the ciliary muscle to correct a hypermetropia or a hypermetropic astigmatism. It may be artificially produced by concave lenses in cases in which there is no myopia, and this knowledge may be utilized in cases of exophoria associated with either emmetropia or slight hypermetropia. The concave lenses develop a pseudo-esophoria which counteracts the exophoria. Pseudo-esophoria is curable by the lenses needed for the correction of the focal error. Often a pseudo-esophoria is grafted on to an intrinsic esophoria, which cannot be changed by the wearing of correcting lenses. In esophoria of hypermetropes, some of it is always pseudo. Pseudo-esophoria lessens with advancing years and finally disappears. It gives most trouble during school life.

Intrinsic Esophoria.—This error is always due to muscle imbalance and has no connection with any form of focal error. It is of two kinds, sthenic and asthenic. In the sthenic form, one or more of the muscles that are concerned in converging the eyes are possessed of more than the normal power, while the diverging muscles are normal in their lifting power. The excess of strength of the interni is due to one of three conditions: they are too large, and therefore, too powerful; or they are too abundantly supplied with nerve-fibers; or they are attached too near the corneo-scleral junction. In either of these conditions the interni would have the advantage over the normal externi. In either condition the line of treatment, as clearly indicated as anything can be, is partial tenotomy of both interni, the object in view being to give these muscles a less advantageous attachment. One operation on each internus should be sufficient; but should some esophoria remain, a second operation on one or both interni, or a shortening of one or both externi, should be done. The safest rule is "*only one operation on any one muscle.*" Another safe rule may as well be given here: "*Never make a complete tenotomy for the cure of any kind of heterophoria.*"

In sthenic esophoria a part of the trouble is often due to a hyperphoria of one eye and a cataphoria of the other. Whenever a hyperesophoria is found the first operation should be done on the offending

vertically acting muscle: first, a partial tenotomy, including all the inner fibers, and as many as may be indicated of the central, of the superior rectus of the hyperphoric eye, thus curing some, if not all, of the hyperphoria and correcting a part of the esophoria. The second operation should be done on the internus of the same eye, dividing only the central fibers, going equally far up and down with the scissors, unless there has remained, after the first operation, some hyperphoria, in which case more fibers should be cut above than below, so as to still further correct the hyperphoria. Some esophoria remaining, the third operation should be done on the internus of the other eye, cutting only the central fibers if there is now nothing but esophoria, but cutting more fibers below than above if there is still some cataphoria of this eye. Later, if there is still cata-esophoria of this eye, the inner and some of the central fibers of the inferior rectus should be cut. Not often is it necessary to do these four operations. If more is needed a shortening of one or both externi should be done. Rhythmic exercise of the externi with weak prisms can cure low grades of esophoria.

Asthenic Esophoria.—In this condition the fault is in the diverging muscles. The adduction is not too high, sometimes even too low, and the abduction is always very low, not more than 2° to 4°. This weakness of the externi is due to a too small muscle, to a too poorly innervated muscle, or to their attachments being too far away from the corneo-scleral junction. The interni not being blamable, they should not be operated upon. The externi should be shortened, the extent of the shortening depending on the quantity of the error. If the attachment is much too far back an advancement should take the place of the shortening.

If there is a complicating hyperphoria, it is best to cut the central fibers of the offending superior rectus, leaving the inner fibers to help the interni do the converging after the externi have been strengthened by shortening or advancement. Here, too, rhythmic exercise of the externi may do good.

Exophoria.—This condition is both pseudo and intrinsic, and it exists much more commonly than does esophoria.

Pseudo-exophoria depends on myopia, exists only in the near, and is curable by concave lenses. It can be developed artificially by convex lenses that over-correct a hypermetropia, hence the half-soundness in giving an over-correction of hypermetropia in such cases of intrinsic esophoria as will not submit to the more rational treatment by tenotomy.

Intrinsic Exophoria.—Of this there are two kinds, sthenic and asthenic.

In sthenic exophoria the muscles that abduct the eyes are at fault, their lifting power being above the normal, while the adducting muscles possess sufficient power to enable them to work in harmony with normal externi. The externi are too strong because they are too large, or too abundantly supplied with nerve influence, or because they are attached too near the corneo-scleral junction. In either case the indication is partial tenotomy of the externi. If a hyperphoria complicate an exophoria, the operation on the offending superior rectus should include all its outer fibers and as many central fibers as may be necessary for restoring the balance between the superior and inferior recti of this eye; and this operation should precede the partial tenotomies of the externi. Any hyperphoria remaining may be remedied by a proper cutting of the tendons of the externi, leaving more fibers below uncut on the hyperphoric eye, and just the reverse on the cataphoric eye. If there should still remain some hyper-exophoria, the outer fibers of the inferior rectus of the cataphoric eye should be divided. Some exophoria remaining, if the abduction is above 8°, a second operation can be done on the externi, one or both; but if the abduction has been reduced to 8° or less, the further operations indicated are shortenings of the interni, or, if their insertions are too far back, an advancement of one or both interni. Not often are so many operations for exophoria, or exo-hyperphoria, necessary. An operator should prefer to do many operations, however, rather than get an over-effect from a few too bold cuts.

In low degrees of exophoria, rhythmic exercise of the interni by means of prisms of from 1° to 8°, will accomplish much if persisted in. The use of strong prisms after any method, is not indicated even in exophoria; and they cannot be used in any other kind of heterophoria. The candle exercise is also good.

In asthenic exophoria the error is not chargable to the abducting muscles, but to those that adduct the eyes, these being too weak either because they are too small, too poorly innervated, or attached too far away from the corneo-scleral junction. In such cases the abduction is 8° or, more frequently, less. The indication is to shorten or advance the interni and never to cut the externi, for the very plain reason that the externi do not possess more than normal strength. Advancement of an internus, in such a case, should be done only when the point of insertion is found too far back, otherwise a shortening, safer and easier, should be done. Exercise of the interni may be tried in suitable cases, especially if operations are declined.

The oblique muscles being abductors, doubtless enter as a factor in

the causation of many cases of exophoria, but in the treatment of exophoria they must be entirely ignored.

Hyperphoria and Cataphoria.—These conditions are never pseudo, that is to say, errors of refraction do not cause them; therefore the correction of refraction errors does not cure them. They are always intrinsic and may be either sthenic or asthenic in character. Hyperphoria of one eye is usually associated with cataphoria of the other, but there is such a thing as double hyperphoria, also a double cataphoria. These terms are much to be preferred to anaphoria (both eyes tending upward) and kataphoria *(both eyes tending downward).

With the new phorometer, in testing for vertical tendencies, many errors may be avoided. In sthenic hyperphoria, whatever may be its quantity, the too strong muscles (upper of one eye and lower of the other) are capable of overcoming a prism of more than 3°; and when this is true a partial tenotomy of one or both is indicated, though this operation should be done with exceeding care because of the risk of over-correction. The central fibers alone should be divided unless the hyperphoria is combined with either an esophoria or an exophoria. When possible the full effect should be accomplished by the operation on the offending muscle of the hyperphoric eye, for the reason that one looks down more than he looks up, and not that it is more difficult to operate on the inferior rectus of the cataphoric eye.

In asthenic hyperphoria, the too strong muscles being able to overcome a 3° prism only, or less, a tenotomy is not indicated. The case should be treated by exercising the weak muscles with prisms after the rhythmic method; or prisms correcting one-fourth, certainly not more than one-half, the error, should be given for constant wearing. Failing to procure relief the indication is to shorten the inferior rectus of the hyperphoric eye.

An unconscious tilting of the head toward the shoulder on the side corresponding to the cataphoric eye, is Nature's way of helping the patient. The habit of tilting is acquired in early life and continues until the hyperphoria is cured.

A double hyperphoria is always attended by trouble in near work unless the object looked at be elevated more than is usual, and even then the patient is inclined to tilt the head forward, as he does also when looking at distant objects. Such patients have a downcast look and yet may never have done a mean act. This appearance is the result of Nature's effort to favor the weak muscles. If the duction power of the superior

*These terms were introduced by Dr. Stevens.

recti is above the normal a partial tenotomy should be performed on each. If below the normal, or even normal, in duction power, the treatment should be by means of straight-forward-to-floor exercise, done rhythmically, with the view of strengthening the weak inferior recti; but failing in this, both inferior recti should be shortened or advanced. A patient cured of the double hyperphoria is also cured of the downcast appearance.

Double cataphoria is not very inconvenient in either near work or distant seeing, unless the superior obliques are weak, but gives to one a pompous appearance, the head being tilted back in Nature's effort to favor the weak muscles. The only treatment to be advised is straight-forward-to-ceiling rhythmic exercise with the view of strengthening the weak muscles.

Cyclophoria, insufficiency of the obliques or latent torsion, is of two kinds, pseudo and intrinsic. Pseudo-cyclophoria is caused by oblique astigmatism in which the meridians of greatest curvature diverge or converge above, whether the astigmatism be hypermetropic, myopic or mixed. When these meridians diverge above, the superior obliques, are forced to torsion the eyes so as to harmonize, as well as possible, the distorted images in the two eyes. The strain on the superior obliques, in any given quantity of oblique astigmatism, increases as the meridians diverge more and more up to 45° from the vertical; but in any and all such cases the strain is at once relieved by the properly adjusted cylinders, which the patient usually receives kindly, the annoying distortion being slight and disappearing soon.

Pseudo-cyclophoria caused by oblique astigmatism, with the meridians of greatest curvature converging above, is as a rule not, in itself, a source of trouble, the inferior obliques being sufficiently strong to effect the blending of the distorted images. The greater the convergence of these meridians, in a given case of astigmatism, the greater is the strain up to 45° on the inferior oblique muscles, which in some cases cannot be comfortably borne. The cylinders correcting the astigmatism relieves the pseudo-cyclophoria, but not at once, nor does its relief always bring comfort to the patient. The relief of the pseudo-cyclophoria, affecting the inferior obliques, often develops an intrinsic cyclophoria affecting the superior obliques; and the patient being less able to bear the latter than the former, the wearing of the glasses is attended by pronounced discomfort that may or may not vanish after a while. For days, and sometimes for weeks, through the correcting cylinders, objects appear distorted (the images are distorted) and for the reason that the inferior obliques, usually strong, keep up for a time the old, but now unnecessary, habit of strain. Only

when this habit of torsion ceases can the axes of the cylinders and the proper meridians be in the same plane. When this does occur there can be no distortion of images and there is, therefore, no longer any apparent distortion of the object. In many cases of this character it is better to correct only a part of the astigmatism at first, adding to the correction from time to time until the full strength cylinder is reached; or giving the full correction at first, place the axis a little in the arc of distortion for the inferior obliques and, later, gradually rotating it to the proper position.

Intrinsic cyclophoria is a muscle trouble *per se*, independent of any focal error. Whenever it can be detected by any one of the several inventions* brought out for the purpose, while the two eyes are looking straight ahead, into practical infinity, it is because the superior and inferior obliques are not capable of balancing each other except when compelled to do so under the imperious law of binocular single vision, which law is suspended by all the tests. If the cyclophoria shows itself only in the near test, the eyes still looking straight ahead, but converged to a point twelve inches away, it is due to a torsioning of the eyes, in or out, by the interni, which evidences that these are attached, in greater part, either above or below the horizontal plane. If the test shows that the eyes are torsioned out, the greater part of the attachment of the interni is below the horizontal plane, and the torsional effect cannot be counteracted by the superior obliques; or if the test shows torsion in, the interni are attached too high, and the inferior obliques are too weak to counteract the torsion. The former is far more common than the latter.

If, in the two tests described above, there is no cyclophoria but the condition manifests itself when looking at the test object a few degrees below the horizontal plane, the causative agent is the contraction of the inferior recti. In depressing the eyes, the outward torsion resulting always from the peculiar attachment of these muscles, may not be counteracted by the superior obliques. But tests will show that looking below the horizontal plane does not often show the existence of cyclophoria, even when it is shown to exist by the other two tests already mentioned. Nor is the explanation far away: the eyes are depressed not only by the inferior recti (which torsion the eyes out) but also by the superior obliques (which torsion the eyes in). The greater the depression of the anterior poles (the elevation of the posterior poles) of the eyes the greater is the torsional power of the superior obliques, the advantage having been obtained

*Price, Perry, Baxter, Brewer, Stevens and Maddox have all invented instruments for detecting cyclophoria, or latent torsion. Some of these can also measure the torsional power of the obliques.

by the position, so that they readily counteract the torsion effected by the inferior recti. This is a wise provision of nature, for we look down far more often than we look up. But if the superior obliques are weak they cannot counteract the torsional effect of the inferior recti with that ease which is possible when they are strong.

In none of the three tests set forth may cyclophoria manifest itself; but in the fourth, looking above the horizontal plane, it will always be shown, except when there is marked insufficiency of the inferior obliques, and the torsion will be outward. The reason is at hand: the superior recti elevate the eyes (they torsion them in, also) aided by the inferior obliques (these torsion the eyes out, also). With the posterior pole of the eyes depressed, the powerful inferior obliques are given, by the position, torsional advantage which is more than enough to counteract the inward torsion by the superior recti; nor can this excess of outward torsion by the inferior obliques be counteracted by the aid of the superior obliques, now at a disadvantage as to torsional manifestation.

Insufficiency of the inferior obliques is exceedingly rare, while insufficiency of the superior obliques is very common, as shown in the first and second tests. Rarely is it shown by the third test, but is always made manifest in the fourth test.

The treatment of intrinsic cyclophoria practically narrows itself down to the treatment of insufficient superior obliques. When it is not found in test *one* but is found in test *two*, a few of the lower fibers of both interni can be divided,* especially if there is esophoria. But the best treatment is rhythmic exercise by means of concave cylinders, their axes in the proper arc of distortion, the upper temporal arc for the superior obliques, the upper nasal for the inferior obliques. Some cases who are not astigmatic are helped by the wearing of weak cylinders, a .50, with axes in arcs of rest for the weak pair—if the superior obliques are weak, and minus .50 cylinders are given, their axes should converge above, more or less, up to 45° for each. Cylinders thus used can do as much for weak oblique muscles as prisms in position of rest can do for weak recti muscles. Exercise of the obliques by cylinders is both as scientific and successful as exercise of the recti by means of prisms.

In our study of muscle anomalies we are too prone to forget that there are intrinsic as well as extrinsic ocular muscles. The sphincter of the iris may be normal in size and efficient in power, so that the quantity of light entering the eye may be regulated with ease and comfort. Again

*The author first suggested operation on the recti to strengthen the obliques, in Washington, several years ago. Last year Dr. Stevens made the same suggestion.

the sphincter may be so small and feeble that it would be impossible, without discomfort, for the pupils to be kept small for a long while, when exposed to bright light. Such eyes, and such only, when free from disease, call for tinted glasses. Other errors may be sought, found and corrected, but if this error is overlooked the patient cannot be entirely relieved. Such patients, when neither converging nor accommodating, suffer if exposed to light reflected from bright surfaces, such as white houses, bright sand, snow, etc. Such sphincters might be strengthened by alternate (rhythmic) exposure to bright light and darkness a few minutes each day.

That there may be abnormal weakness of the ciliary muscle in young people is a matter of too easy demonstration to be doubted. Its lifting power should be 3.00 D (it should overcome a minus 3.00 sphere without the aid of convergence). If it can do more than this, it is well; but if less, it will be a source of trouble which should never be overlooked, because it can be remedied. The remedies are two; first, presbyopic lenses before the presbyopic age; second, rhythmic exercise by means of minus .50 spherical lenses. The exercise should be resorted to once in the twenty-four hours, and continued for ten minutes. The patient should be seated eight to twelve feet from the object to be looked at—a figure on the wall, or, if at night, the blaze of a candle—and the frames containing the minus spheres should be raised and lowered at regular intervals of three to five seconds throughout the sitting. The lenses for correction of focal errors should be worn during the exercise.

The Pupil Reflex in Infectious Diseases.—Dr. Corte draws the following conclusions: (1) In measles, scarlet fever, and ordinary small-pox the pupil reflex is normal; in the primary form of hemorrhagic small-pox it is weaker or absent. (2) In typhoid fever, complicated with lung affection, the pupil reacts slowly, whereas in infectious endocarditis the pupil reflex is absent. (3) In puerperal fever, complicated with endocarditis or peritonitis, the pupil reflex is wanting—*Klin.-therap. Wochenschrift, May, 1898.*

THE

OPHTHALMIC RECORD.

A MONTHLY REVIEW OF THE PROGRESS OF OPHTHALMOLOGY.

VOLUME VIII. CHICAGO, JANUARY, 1899. NO. 1. NEW SERIES

EDITORIALS.

The official circular has been sent out announcing the meeting of the *Ninth International Ophthalmological Congress*, which will be held at Utrecht, Holland, August 14 to 18, 1899.

THE OCULAR QUALIFICATIONS OF THE OCULIST.

("*And why beholdest thou the mote that is in thy brother's eye, but perceivest not the beam that is in thine own eye?*"—Luke, vi. 41.)

While it is not to be gainsaid that mind is the master, and that a clever workman may sometimes do good work with imperfect tools, it should be remembered that good instruments are essential to full production and perfect work. If in any art there be needed supernormal visual acuity, accurate perception and generally strong eyes, it is in medicine. Yet there are a large number of men with defective vision who are doing more or less work in our profession—and some of these have not only climbed the ladder of fame, but are leaders in medical science at the present day. Their success is due to their brains; but they themselves will acknowledge that they have been more or less handicapped in their life work by their ocular defects. All the more honor is due them; but what of the coming men, those who are entering our more and more crowded profession?

If a physician should possess all the senses, even more should the specialist have them to an exceptional degree. He is supposed to see what to others is hidden, and thus should have the natural qualifications essential to support his claims as a specialist. There are many young physicians now studying ophthalmology who would attain more complete success, or who at least would not fail, if they would further qualify them-

selves for the honored position of general practitioners of medicine rather than go handicapped into a specialty which demands such good vision.

The following, to which I think we may all subscribe, is abstracted from a portion of the text accompanying Professor Haab's new "Atlas of Eye Diseases." ("Aussére Augenerkrankungen." Bd. XVIII Lehmann's Medium Hand-Atlanten. München, 1899):

"It is often observed that physicians who are studying ophthalmology, preparatory to special practice, pay little attention to their own eyes. An especial amount of visual acuity is very necessary in this specialty, although for ordinary examination of the anterior portion of the eye a moderate degree of visual acuity may be aided by enlargement by the magnifier; for ophthalmoscopic examination the person who does not see well is always behind the sharp sighted. Especially persons who have considerable astigmatism are not fitted to recognize external eye diseases as well as those of the fundus, although some may do so, but these with much greater labor.

"A slight amount of myopia (1 to 3 D) is better than hyperopia, because the age of the person soon makes the early use of convex glasses necessary, which for close examination and in operations, although they do not greatly interfere, are disagreeable and render examination more difficult. The perfect accomplishment of binocular vision is very necessary for proper stereoscopic sight, and especially for the accurate determination of depth, in examination of many ocular disease processes. Thus those who only see with one eye are deprived of a very great aid, that is, the correct determination of distance and dimensions. This is, of course, helped a great deal by the use of the loupe, but this instrument is not available in many operations.

"Of course, it is possible for some who have only one good eye, or whose eyes do not work in a normal manner, to overcome these defects in a great measure, but this depends upon the person, and, at any rate, facility of handling comes to them later than if they had sharp sight. Even if they finally acquire a knowledge of diseases and facility of operation with great amount of labor, and have brought lenses and all other forms of help to the aid of their diminished sight, for researches or procedures of an operative or exploratory nature they are handicapped by those who see better.

"I certainly know oculists who have only one good eye, or who have astigmatism, who are able to do proper work, but that does not count for the case of students who wish to take up special eye practice. I advise

them to only do this if a proper examination of the eyes has shown that the visual acuity is at least one and a half times that of the average person, that good binocular vision is present, and that color blindness is absolutely excluded. Those who undertake ophthalmology, without these requisites, are certainly destined to be in more or less danger of being excelled by those who have been given better eyes by nature."

H. V. W.

At the meeting of *New York State Medical Society*, Dr. Oppenheimer of New York City, read an interesting paper on "Eye Lesions in some Diseases of the Kidneys." He said that the most frequently observed lesion of the eye in connection with the disease of the kidney, was retinitis albuminurica. He states that these cases were almost always associated with hemorrhage, which darkened the prognosis, as it might be assumed that the same condition was present in the brain. Dr. Oppenheimer believes the retinal condition to be dependent upon the condition of the blood associated with cardiac hypertrophy and high arterial tension.

Uremic amblyopia occurring in the course of nephritis incident to exanthemata or during pregnancy should be distinguished from true retinitis albuminurica. The former is accompanied by headache, nausea, vomiting, scanty and albuminous urine, and more or less loss of vision. Uremic convulsions may occur. The prognosis is usually good in these cases, and the reaction of the pupil to light proves the blindness to be of central origin. The ophthalmoscope reveals no appreciable lesions. Albuminurica retinitis, on the contrary, comes on gradually in the course of chronic nephritis and is accompanied by distinct retinal lesions.

An English observer gives the results of some of his investigations on the appearance of the eyes in animals under various emotional conditions. He noticed that the pupil of a fox terrier, when teased beyond endurance, became greatly dilated. He also observed the same phenomena in cats and monkeys when enraged or meditating mischief, and that when they meditated an attack upon some other animal their pupils became suddenly contracted.

REPORTS OF SOCIETIES.

OPHTHALMOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

NOVEMBER 10, 1898.

An ordinary meeting of the society was held on November 10th. Mr. F. Richardson Cross, vice-president, being in the chair.

Mr. Priestley Smith read a paper entitled *The Accommodation Theories of Helmholtz and Tscherning: Suggested Explanation of their Discrepancy.*

He said that Tscherning's theory was sharply opposed to the generally accepted explanation, but was based on very accurate observations. The question was whether the accommodation change in the lens depended on slackening of the zonula (Helmholtz) or on tightening (Tscherning). The anatomical arrangement of the parts concerned and nearly all clinical and experimental facts, especially the observations of Hess, which showed that during strong accommodation the lens was often tremulous and displaced downward by gravity, strongly favored the former view. Tscherning, however, had proved that during accommodation the anterior lens surface changed from a globular to a hyperboloid curve — that is, tended to become conical — sharper at the center of the pupil and flatter toward the margin, and this, he contended, could only be caused by tightening of the zonula, supplemented by internal resistance at the pole of the lens. Mr. Priestley Smith's object was to show that this change could be equally well explained by slackening of the zonula. Let the case of an elastic circular hoop of steel first be taken. Traction at the sides transformed it into an ellipse; the curve flattens at the poles and sharpens at the equator, and somewhere intermediate between these regions was a point where no change took place. The position of this point and the general contour assumed by the hoop were governed by the varying resistance which it offered at different points. By modifying the resistance the curve could be modified at pleasure. Let the resistance at the pole be increased and the conical form observed by Tscherning was obtained; let it be increased toward the equator and the opposite effect — namely, a flattening at the pole and a sharpening of the curve elsewhere — was

obtained. Mr. Priestley Smith exhibited a model consisting of an elastic hoop of metal bent so that it assumed in exaggerated form the shape of the lens during accommodation — namely, conicity of the anterior surface. It was strengthened with supplementary elastic strips in such a way that its resistance or rigidity increased progressively from the pole toward the equator. Traction at the equator, representing tightening of the zonula, reduced the conical to a spherical form. In the latter condition it represented the lens when subjected to the influence of the zonula; in the conical state it represented the accommodative change which occurred when the zonula was slackened by contraction of the ciliary muscle. It would be easy to theorize as to the resistance proper to the crystalline lens and to show reason for supposing that the arrangement of the fibres was such as to render the resistance progressively greater toward the equator, but Mr. Priestley Smith said he would not go beyond demonstrable facts. What he desired to show was that the changes which Tscherning had demonstrated with such admirable skill and ingenuity were not incompatible with the theory of Helmholtz. To his mind they were explained more satisfactorily by this theory than by any other.

Mr. Lang asked the author his views as to the effect of the constant growth of the lens on accommodation of it when near objects are viewed.

Mr. Ernest Clarke asked if normal lenses removed from the eye would assume the shape they are said to do in the eye when the suspensory ligament is relaxed.

Mr. Bass asked whether the capsule offered a uniform resistance to the entire anterior surface of the lens, as if the center were thinner either compressing the periphery of the lens or slackening of the capsule would have precisely the same effect.

Mr. Hartridge said that in cases of congenital dislocation of the lens it was always more globular than when under normal conditions; this therefore was in favor of Helmholtz's theory.

Remarks were also made by Mr. Doyne and the chairman.

Mr. Priestley Smith said in reply that the continuous growth of the lens was obvious in the enlargement and sclerosis of the organ with advancing age, both changes representing the steady development of epithelium in an enclosed space where there was no means of escape; this of course was inevitable.

The lens when free actually took the shape he had illustrated on the model, although this was much exaggerated by it.

The anterior capsule was thicker than the posterior and the juvenile lens was so soft that the slightest pressure only was needed in order to

change its shape. He commented strongly on the manner in which Helmholtz's measurement of the antero-posterior diameter of the lens, viz: 3.7mm. had been copied into almost every text-book, whereas the true measurement is 4.5 to 5mm.

Abstract of "A Case of Myxo-Fibroma of the Optic Nerve Sheath."

Mr. Arnold Lawson read this paper:

Ethel D——, aged 2 years, was brought to the Paddington Green Children's Hospital on January 13, 1898; the mother stating that she thought the left eye was blind and larger than the right. The illness dated from the previous October, when the failure in sight was first noted. The "growing out of the eye" had been noticed for a few weeks. The child's family and previous history were both excellent. She was a fat, healthy looking child in apparent excellent health. There was very slight proptosis of the left globe directly forward without any limitation of movements. Nothing abnormal could be felt behind the globe, there was glandular enlargement; and ophthalmoscopically the media was normal and the only striking thing was the large size of the veins. There was no chemosis of lids or conjunctiva, and the left pupil was decidedly sluggish in action.

Five weeks later the proptosis was decided, but movements normal. Left pupil quite insensitive to light and semi-dilated. The optic nerve was paler than right and the veins very large, but exhibited no pulsation, nothing could be felt behind the globe. A probable diagnosis of optic nerve tumor was made.

A few weeks later all the symptoms had much increased and the nerve was of a chalky white color. The child now began for the first time to be peevish and fretful and occasionally put its hand to the left eye. Immediate operation was advised but had to be postponed for nearly two months on account of a severe attack of pertussis, so that the operation was not performed until four months after the child's first visit. Before the operation the proptosis was very considerable and the nerve of a brilliant whiteness. The retinal arteries was very pale and reduced to threads. Still nothing could be felt behind the globe. The child's health was very good, though it was fretful.

The operation consisted in extirpation of the eye and orbital contents. The orbit was almost completely filled by an exceedingly hard tumor of the density of cartilage, which extended back to the very apex of the orbit. The orbital fat was nearly absorbed and the muscles reduced to fine atrophied bands. The tumor lay quite free within the orbit and the periosteum and bone were not infiltrated. Great difficulty was experienced

in removing the tumor without excising it in small pieces on account of its extreme hardness and large size. The optic foramen was of normal size, but as a precaution it was scraped out as far as possible with a very small sharp spoon. The orbit was plugged with tampons of bi-cyanide gauze, and the child made an excellent recovery and is perfectly well at this present time, six months after the operation.

Microscopical sections of the tumor showed it to be of quite simple structure, consisting of interlacing dense bands of fibrous tissue, with here and there patches exhibiting well-marked myxomatous changes. It entirely surrounded the nerve throughout the whole of its intra-orbital course. A section of the growth showed the nerve lying quite free within its sheath, the interior of which was smooth and normal whilst the outer layer was incorporated with the growth. It was quite impossible to tell whether the dural or pial sheaths were the source of origin, but the fact that the outer surface of the tumor was smooth and covered by an ill-defined capsule might point to the latter, being the expanded and attenuated dural sheath, and that the tumor sprang from the outer surface of the pial sheath. The whole tumor was of about the size of a partridge's egg.

Attempts to save the eyeball in cases of solid orbital growths were, in Mr. Lawson's opinion, to be strongly condemned. He maintained that it was impossible to remove the orbital tissues surrounding the growth in a satisfactory manner if the globe was retained. The vast majority of solid orbital tumors were malignant and liable to recurrence. Even benign tumors would recur locally if any trace were left. It was but rarely possible to be certain of the nature of a tumor until after microscopical examination, and free removal of surrounding soft spots should therefore be routine practice, after exploratory incision in cases of doubt. With the globe retained the surgeon worked in an awkward, narrow pit, guided only by touch, without vision, and risk of recurrence was greatly increased. A recurrence might indicate the extension of the disease beyond the surgeon's control and a patient's life imperilled by his conservate surgery. The procedure seemed to him equivalent to removal of a scirrhus mammae without amputating the breast:

There was considerable mortality recorded after these operations. Finlay's list (Knapp Archives, 1895,) gave eleven deaths after sixty-eight operations, or 16 per cent. The universal cause of death was septic meningitis. The mortality was not really so formidable. Since 1872 only two deaths had occurred out of thirty operations, or about 6 per cent., the improvement being no doubt due to the improved methods of

asepsis. The chief cause of danger in wounds involving a deep pit like the orbit was the collection of blood-clot, which readily decomposes. If the cavity were kept quite dry and plugged with aseptic tampons there should be very little risk of septic meningitis.

Myxo-fibroma was an excessively rare form of optic nerve tumor. The present case was the forth recorded example. Mucoid changes were very common in all forms of optic nerve tumors, 37 per cent. of Finlay's list of 117 being affected in this way. The vast majority of optic nerve tumors were growths of the sheath and not of the nerve proper, so that neuroglia, which was very prone to myxomatous change, had no part in them. Many hypotheses had been advanced, but none were satisfactory. Mr. Lawson suggested that the close proximity of these growths to the one udemal myxomatous tissue in the body, viz., the vitreous, was more than a coincidence. The vitreous was developed by an involution of the mesoderm into the upper end of the optic cup, which formed the choroidal fissure. If, during the closure of the fissure, a fragment of embryonic vitreous was excluded and afterward wrapped round by the mesoderm forming the optic sheath, all the materials were at hand for the formation of a mesodermic involution tumor, which would be expected to exhibit myxomatous tissue as a characteristic feature, just as dermoids always contained skin elements. The theory was advanced not to account for all tumors of the optic nerve, but only for a certain number in which myxomatous changes were found. An involution of embryonic fibrous tissue with the arteria centralis retina where it enters the optic sheath might possibly, as Braunschweig suggests, account for the origin of other varieties.

Mr. Herbert H. Folker (Stoke-on-Trent) reported five cases of toxic amblyopia due to lead which occurred among employes in the pottery district. 1. A female, aged 26 years, had worked in the dipping-house two years; on four occasions she had had symptoms of lead poisoning, colic, vomiting, and headache. Vision failed in the left eye and four days later in the right; the failure began with flashes of light and colored vision and rapidly proceeded to total blindness. The pupils were dilated and inactive, the optic discs were pale and blurred, the retina was œdematous, and there were several hemorrhages in it. There was some albumin in the urine. 2. A female, aged 20 years, six weeks after beginning work as a lithographer had headache and colic; after a year she had sudden total loss of color vision, followed by sensations of flashes of light. There was typical neuro-retinitis with hemorrhages. In this case vision improved. 3. A male, aged 16 years, employed in the dipping-

house, after two years had diplopia with headache, colic and vomiting; the vision failed shortly after, and in six weeks he was totally blind. He also had colored vision for a time and flashes of light. The optic discs were very white and the arteries were reduced to white cords. He had a trace of albumin and a gum line. 4. A female, aged 18 years, employed in the dipping-house, after three years had headache and vomiting; the vision failed in one night; she had flashes of light of various colors. The optic discs were intensely white. 5. A female, aged 18 years, employed in the dipping-house, had had for ten months several attacks of headache, colic, and vomiting; then the sight failed, and in two months she was blind. The optic discs were white and the vessels were small. In this series of cases all other toxic agents were excluded. None of the patients who had worked in the dipping-houses responded to treatment, the case of the lithographer did; in the former the poison was introduced by absorption through the skin, in the latter by inhalation. With one exception all the cases experienced colored vision. Treatment was by iodide of potassium or strychnine by the mouth or hypodermically.

The following cases were shown:

Major M. T. Yarr, R.A.M.C.: Case with fundus changes and fibrous tissue formation in the vitreous, probably congenital.

Mr. Doyne: Case of pigmentation of the conjunctiva.

Mr. Treacher Collins: Case of monilethrix affecting eyelashes and eyebrows.

Dr. Galloway, in commenting on this last case, said that the disease was very rare and that it ran in families; this patient belonged to a family very well known to the dermatologists of London. The curious condition is due to atrophy of the medulla of the hairs at the internodal spaces.

SAN FRANCISCO SOCIETY OF EYE, EAR, NOSE AND THROAT PHYSICIANS.

Meeting of November 17th, 1898.

Presentation of Cases.—By Dr. W. F. Southard: A case of atrophic and congenital excavation of both optic discs measuring 6 diopters.

By Dr. Geo. H. Powers: (1) A case of right proptosis with limited motion in all directions. There was chemosis and a relative scotoma occupying the lower half of the field, together with oedema and swelling of the upper portion of the retina. The condition was of very sudden onset. (2) A case of left convergent strabismus with excentric fixation inward. When first seen there was amblyopia; V. = $\frac{20}{200}$ barely, and extinction of the nasal side of the field. After tenotomy of the internal

rectus there was complete restoration of the field of vision. (3) Wound of the cornea from a hatchet, extending nearly horizontally across the whole breadth of the cornea. The upper half of the iris was torn from its attachments and protruding from the wound, was removed. The wound healed kindly, leaving the lens perfectly clear.

By Dr. A. Barkan: (1) A case of discission and removal of the lens for high myopia (malignant) with gratifying visual results. The patient was a woman of 45, with O. D. M. = 19 diopters; O. S. M. = 21 diopters. V. O. D. = $\frac{2}{200}$, counting fingers at 2 feet with — 19D. V. = $\frac{6}{200}$. In the right fundus there were small opacities in the vitreous; extensive post. staphyloma surrounding the disc, and numerous clearly cut atrophic areas scattered over the background and reaching to the macula. A moderate discission was made in the substance of the lens, followed by the usual swelling and some ciliary irritation. Twelve days later linear extraction was done with a lance knife in the usual way, and the greater part of the lens matter removed. Result: V. with — 2.00 cyl. axis 90° = 10/200. Reads Snellen 1 at 8 centimetres with + 9.00s ◯ 2.00c axis 180°; counts fingers at 12 feet. (2) A case left of congenital microtia in a girl aged 10. The auricle consists of an elevated ridge about two inches long, the upper half being cartilaginous, and the lower, soft tissue, the whole having the appearance of helix and lobule attached to the side of the head without other parts. At the center of the cartilaginous portion there is a small depression about 3mm. in depth, and posterior to this a small rudiment of cartilage at about the lower border of the osseous meatus, the margin of which can seemingly be felt.

As usual in such cases, it is difficult to determine whether there is any hearing whatever. When the good (right) ear is tightly closed a whisper can be heard in the left ear at eight inches, using the hands as a funnel. Bone conduction is also doubtful.

Dr. Philip Mills Jones stated that he had seen a similar case in which equal difficulty had been encountered in determining the existence or not of hearing.

CHICAGO OPHTHALMOLOGICAL AND OTOLOGICAL SOCIETY.

A regular meeting was held December 13th, 1898, the President, Dr. W. F. Coleman, in the chair.

Dr. Emanuel F. Snydacker read a paper entitled *Some New Facts on the Etiological Organism of Trachoma.* He gave statistics showing the frequency, gravity and long continuance of trachoma. Of 324 new patients received as house cases at the Illinois Eye and Ear Infirmary from June

1st, 1898, to November 1st, 1898, 123, or about 38 per cent., were cases of trachoma. Other patients come and go, but trachoma patients remain interminably, so that of 41 patients now under his observation 23, or 56 per cent., are cases of trachoma.

Trachoma can never be called cured. The lids may become perfectly smooth, and the disease seem perfectly mastered, but in the course of a few weeks or months the patient will return with a trachoma which has all the characteristics of an acute disease. Of 50 cases of trachoma, in which he had made careful records, 38 were cases where the disease had lasted over two years, 13 where the disease had lasted more than five years, 7 where it had lasted more than ten years, and in one case it had lasted thirty-eight years. In the 38 cases which had lasted more than two years, there were only 4 who had had no corneal involvement. Of these, one was employed about the hospital, and consequently had been under constant medical care, while in another case it was very doubtful whether the disease was trachoma or not. In no case where the cornea has once become involved, either through ulceration or pannus, does the patient regain normal acuity of vision. In his series of 50 cases the average acuity of vision was 2/7, though this does not allow for refractive errors. Between the dates of June 1st, 1898, and November 1st, 1898, 122 patients were operated upon at the Infirmary. Of these operations 41, or 34 per cent., were necessitated by trachoma. These figures do not include scarifications. A patient who has once had trachoma is more or less unfitted for the active duties of life in the opinion of the essayist. Exposure to dust, heat, or bright light, residence in a malarial district, unhygenic surroundings, negligence in the use of the proper medicines may bring on an acute exacerbation of the disease at any moment.

The author goes into the literature of trachoma in a very exhaustive manner, quoting from Sattler, De Gama Pinto, Michel, Schmidt, Kucharski, Goldschmidt, Baumgarten, and many others. He also narrated his investigations with the trachoma nodule itself, subjecting it to the various methods for staining bacteria within tissues, and to see whether or not the micro-organisms could be found within the nodule. The methods he employed were the two well known ones for staining bacteria in tissue. First, staining with Loeffler's methylene blue and decolorizing with acetic acid 1-1000; second, the Gram-Weigert method. He prepared fifteen different sections according to these two methods, and in every case he found within the nodule organisms which presented striking morphological characteristics. These organisms were present in greatest

numbers in the loose adenoid tissue of the mucous membrane. They were commonly seen in small groups, usually in the intercellular spaces, although he has observed them within the leucocytes, in the protoplasm of the epithelial cells, and at times in the blood vessels of the nodule. The organism had a capsule, but whether it was a capsulated diplococcus or a tiny capsulated bacillus, with heavily staining ends, neither he nor a number of other observers was able to state with any degree of certainty. Its size varied from .1½ to .2 millimeters in length, and from .5 to .6 millimeters in width. The organism was not decolorized by the Gram method of staining. The essayist tabulates the results of his studies of sections, smears and secretions as follows :

1. He found within the trachoma nodule in fifteen cases an organism varying in length from one-half to two millimeters, and from .5 to .6 mm. in width. 2. This organism was enveloped in a gelatinous capsule. 3. No other organism could be found within the tissues. 4. This organism was stained by the Gram method. 5. While seen only within the tissues or in smears, it was impossible to positively say whether this organism was a diplococcus or small bacillus. 6. The organism was usually found in the adenoid layer of the conjunctiva, most frequently between cells, though at times within them, very rarely in vessels. 7. It is quite abundant in the secretion of recent cases where no astringents or antiseptics have been used, but almost impossible to find after these have been used some time. 8. In the secretions it was possible to decide that the organism was a dot-like, capsulated diplococcus.

He next describes the task of getting a pure culture of the organism. He was successful in obtaining pure cultures, these being contaminated in only two cases.

For the sake of accuracy, the author briefly tabulated and recapitulated all his findings in regard to this organism, thus:

Origin.—Unknown. Seems to occur most frequently in malarial districts.

Form.—Round diplococci, which in the tissues and first bouillon culture are enveloped in a gelatinous capsule. In the tissues they lie in small groups, each organism separate from the others. In bouillon they usually are seen as isolated diplococci; at times they are seen in small clusters or short chains, though the clusters and chains are always composed of diplococci. At times the diplococcus is seen turned on end, so that only a single coccus appears. In this position it is often possible to see the capsule especially well marked. On solid culture media they simulate staphylococci; on gelatin they show an intermediate form.

Motility.—In the hanging drop the organisms exhibit a slight degree of motility.

Vitality.—Cultures die on culture media in about two weeks.

Aniline Stains.—Organism stains well with ordinary aniline stains; also by Gram method. Capsule does not stain, but septum between cocci seems at times to have an affinity for stains, especially for methylene blue, causing the organism often to resemble a bacillus.

Growth.—Grows rapidly in incubator, more slowly at room temperature. Bouillon becomes turbid in thirty-six hours. Abundant growth on serum in forty-eight hours. Grows somewhat slowly on agar, especially at room temperature.

Growth on Serum.—White, moist, membranous-like streak along line of inoculation, with a scalloped edge. Edges white, the center yellowish.

Growth on Agar.—Resembles somewhat the growth on serum. The edge exhibits the same scalloping. The growth on agar is more raised than that on serum. The difference in color between the center and the borders of the growth is even more marked. The center is distinctly yellow, while the borders are milk-like.

In Bouillon.—At the end of ten days white, sand-like deposit settles at bottom of tube.

In Gelatin.—Growth somewhat funnel-shaped. White, wavy, thread-like growth along the stab, consisting of small agglutinated globules; grows somewhat heavier toward surface, and on the surface forms a white membraneous growth which shows the same peculiar scalloping of the edges as the growth on serum. The gelatin liquefies very slowly on the surface, but not along the stab.

Oxygen Requirements.—Facultative aerobin.

Odor.—After developing one week on any of the culture media, and especially in bouillon, has a pronounced urinous odor.

The essayist compares his findings with those of other men who have investigated this subject, and especially of those whose results have in a measure coincided with his own.

Clinical Significance of this Work.—In the early stages of trachoma, and frequently, even after the lapse of some time, it is impossible by the methods now employed to state with certainty whether the case before us is one of that disease or not. Can a diagnosis be made with absolute positiveness? Unquestionably, yes. If one can find within the secretions or in the contents of the expressed follicles an organism such as he has described, he may with absolute certainty call the disease trachoma. Furthermore, he must use every precaution to prevent the patient from infect-

ing others, for that organism, under favorable circumstances, will certainly cause the disease in others, no matter how mild a form of the disease the patient himself may exhibit.

Can the organism be found in enough cases to render it valuable? Again, undoubtedly, the essayist answers yes. Where one suspects trachoma there are almost invariably enlarged follicles. Squeeze out one of these follicles, smear its contents on a cover glass, fix them in the flame, stain them by Gram's method, and if a capsulated diplococcus is present, the case is undoubtedly trachoma; if it is not present, the case is in all probability not trachoma.

In his series of fifty cases of trachoma, in only seventeen cases were members of the patient's family afflicted with the disease. In cases where one of a married couple had contracted the disease, the other in nine cases escaped. This seems strange, when it is remembered how notoriously infectious trachoma is, and how it has been known to run through camps and institutions like wild-fire. There are, in the light of these investigations, several reasons for this. Where antiseptics are used the secretions soon become harmless, and may often with impunity be inoculated into other eyes. Then, again, the organism is very difficult to cultivate. If the soil is not favorable it soon dies. When he inoculated the human conjunctiva it was necessary to massage it into the conjunctiva; merely placing it in the sac proved of no avail. Undoubtedly, the conjunctivæ of debilitated individuals, especially of such as have suffered from malaria, afford a more favorable site for growth than those of healthy people, and undoubtedly where the disease spreads rapidly it is among the former class and from the secretions of those who have not been treated with antiseptics.

The period of incubation of trachoma is difficult to answer, even when one has watched the disease develop from day to day. The symptoms caused by the micro-organisms are certainly well marked by the end of the first week. By the end of the fifth week a diagnosis may be made from the aspect of the case.

He has now found the organism of trachoma in the tissues and secretions; he has obtained it in pure cultures; he has produced the disease and again obtained the diplococcus.

One task remains unfinished, which is by far the most practical and important of all, namely, the study of the toxins and anti-toxins. A description of his work on this subject he reserves for a future paper. Suffice it to say, that he inoculated one-half liter of bouillon with a pure culture of the diplococcus and allowed it to develop for ten days; this bouillon was then filtered through a Kitasato filter. This filtrate injected

into animals and human beings causes local pain, redness and edema, with a marked temperature reaction; 4½ c. c. of this filtrate injected into the flank killed a guinea pig weighing 300 grams. If a guinea pig is treated with increasing doses of this filtrate, as fast as the temperature from the previous injection has subsided, it may receive twice the lethal dose without showing other symptoms than a temperature reaction. These facts lead the essayist to hope that an efficient trachoma anti-toxin may be found. If the action of anti-toxin is, as recent investigations tend to prove, a chemical and not a biological one, then surely a local disease like trachoma is an ideal one for the application of anti-toxin.

Dr. Henry Gradle: Discussion of the paper is scarcely possible, except on the part of those who are engaged in similar work, and who might possibly point out the pitfalls and snares into which the experimenter might have fallen. One who is only familiar with the work and writings of other men along this line is not as well competent to discuss the subject. Dr. Snydacker's work undoubtedly represents a great deal of painstaking labor. But claims of having discovered the microbe of trachoma have been put forward by others, and they have never received full recognition. When the subject of trachoma was under discussion in various ophthalmological meetings, Sattler did not press his own claims of the discovery of the micro-organism of this disease. Michel's claim has likewise been poorly received. There can be no doubt from a modern point of view but what trachoma is a disease due to some parasite, but that it must necessarily be a bacterium is an open question. We are familiar with other forms of bacteria, such as the plasmodium of malaria, and the unidentified but visible microbe discovered by Nocard in pleuro-pneumonia of cattle. The fact that so many competent observers have hitherto failed to detect the bacterium characteristic of trachoma and capable of reproducing the disease, should caution us against having too fervid a faith in Dr. Snydacker's present statements.

Dr. Gradle asked whether the essayist has searched for the same microbe in other conjunctival diseases. A few years ago Burckhard, of Berlin, described some cell enclosures, evidently not bacteria, but presumably coccidia, as characteristic of trachoma. A short time afterwards he admitted that the same bodies could be found in a variety of other conjunctival diseases, and thereby dropped his claim of their specific nature. From that point of view it would be interesting to know whether similar microbes have been searched for in other inflammatory affections of the conjunctiva.

Dr. Emanuel F. Snydacker said he did some work on secretions about a year ago. Cultures were made from the secretions of eyes, especially

such as were suffering from conjunctivitis; when it came to plating these cultures, the work led to such dimensions, so many kinds of germs were found, that he abandoned it.

As to the practical bearing of his present work, he cited one case. About a week ago a patient was admitted to the Infirmary, in whose case it was difficult to decide whether trachoma existed or not. The upper palpebral conjunctiva had the normal, smooth, yellow, glistening appearance of health, but there were follicles in the lower cul de sac. He squeezed out these follicles, smeared some of them on a cover-glass, fixed them, stained with aniline gentian violet, treated two minutes with Lugol's solution and decolorized with absolute alcohol. The characteristic organism was found.

The principal difficulty lies in the minute size of the organisms, and often in their scarcity. One must have a thin smear, a good lens, and a good light, and, above all, patiently search his whole specimen. In most cases of true trachoma the organism can undoubtedly be found. It is a far more reliable method of diagnosis than the microscopical diagnosis of gonorrhea. In gonorrhea there is absolutely no method of telling the gonococcus from the pseudo-gonococcus except by making cultures, and everybody knows the difficulty of cultivating these germs. He considered it impossible to say from morphology alone whether a germ is gonococcus or not, but the small capsulated diplococcus of trachoma may be diagnosed with the microscope alone.

Dr. Henry Gradle referred to the clinical aspects of the difference between trachoma and follicular catarrh. First of all, we must clearly recognize the existence of follicles independent of trachoma. If Dr. Snydacker can verify his claim that the microbe which he has described is characteristic of trachoma, its presence would settle the diagnosis in any given case definitely. Whenever such a microbe is present, we would necessarily have to call the disease trachoma, no matter how it appears clinically, exactly as we call a disease tubercular if the tubercle bacillus is present, no matter how different its appearances may be to the naked eye or under the microscope. But we have not yet arrived at that stage of certainty. Clinically, however, enlarged follicles can be found in a variety of conditions which have nothing to do with trachoma. First of all, in a large number of school children we will find enlarged follicles in the lower retro-tarsal fold, to a less extent on the upper lid, or in the upper retro-tarsal fold. These follicles persist for months and even years without developing into any of the lesions characteristic of true trachoma, without ever involving the cornea and without showing any progressive character. All present must have seen this condition

and know that it is sometimes very intractable to treatment, but if we relieve the refractive condition, the patient is materially improved subjectively and the follicles cease to annoy him. We must recognize the existence, therefore, of true follicular catarrh, not identical in any way with trachoma from a clinical point of view, the difference being one of progressiveness and the absolute immunity of the cornea in true follicular catarrh. About eighteen years since there was a moderate epidemic of this form of conjunctivitis in Chicago. Dr. Gradle had a number of cases that were slightly follicular from the start; others were not, but became follicular, most of the cases yielding to applications of nitrate of silver. The follicular and non-follicular cases were due to some virus, because the affection occurred often in the same family. Three or four members of a family were affected within a short time of each other, the process of healing taking place rapidly under appropriate treatment or sometimes without it in some, while in other cases follicular development took place. Some of the cases developed a condition subsequently which brought up the question as to how far it was identical with trachoma. He recalled three cases which after some months of neglect presented large follicles, which, when seen at that time, could hardly have been distinguished from true trachoma. But the subsequent history was entirely different. All of these three cases he had originally seen; they had neglected themselves. They were better, after short treatment, but returned after some months, when large follicles were present. The difference between these follicles and true trachoma was this: They were situated more on the tarsal and less on the retro-tarsal portion; they were never sago-like, but yet resembling in many respects the follicles seen in trachoma. All of these cases were cured by a single expression with the Knapp roller forceps. Subsequent observation confirmed the absolute cure.

Dr. De Swartze had made examinations of the follicles of trachoma, and later on made a few examinations of the follicles of follicular conjunctivitis, using the same method which Dr. Snydacker employed, and had found no such organisms in any of the follicles such as Dr. Snydacker describes.

Dr. William T. Montgomery: We have all had experience similar to that related by Dr. Gradle with the follicular form of conjunctivitis, and from that fact had been led to believe that it is an entirely distinct type of inflammation. He had repeatedly by a single expression in cases of follicular conjunctivitis relieved the patient permanently of the trouble. The cornea is never involved in that form of the disease, which is a feature very different from what we find in true trachoma.

NEWS ITEMS.

Personals and items of interest should be sent to Dr. Frank Allport, 92 State St., Chicago.

We are pleased to learn that Dr. Edmond Landolt, of Paris, has accepted the invitation of the ophthalmic section of the Americal Medical Association to give an address before that body in Columbus next June. Dr. Landolt has chosen the title, "Some Disturbances of the Ocular Movements."

Owing to the pressure of other duties Dr. Casey Wood has resigned the position of editor-in-chief of the *Annals of Ophthalmology*, with which he has been actively connected for over seven years. It is possible that he may retain the special department of Italian ophthalmic literature, which he has edited for some time past.

At a recent meeting of the Washington Eye, Ear, Nose and Throat Hospital, it was announced that Bishop Satterlee had set aside the last Sunday in October as hospital Sunday, and that all collections on that day, in the local churches, would be donated to the hospital fund. The Directors are endeavoring to secure an endowment of $50,000. The total number of patients treated during the past nine months, ending September 30th, was 1,027; 553 white and 474 colored. 136 patients have been received into the hospital; 173 operations have been performed; $998 has been received from pay patients.

An English physician examined the physical condition of one hundred boys in one school, and found sixty-three of them subject to some deformity or other. Twenty had defective eyesight. This report would be more intelligible if a statement had been made as to what he meant by defective eyesight. If he meant some form of ametropia correctable by glasses, the statement is not very startling, but if he meant incurable lesions, it does not speak very well for the physique of the average English boy.

Dr. Helm of Cornwall, England, recently had an opportunity of examining the instruments which the "Indian Oculists" use in the couching of cataracts. They are two in number. The operation consists first in making an incision in the sclerotic behind the ciliary attachment of the iris. This they do with a huge old-fashioned lancet, which is usually rusty and very dirty. Into this incision the second instrument is inserted, namely, a large copper probe with a conical end of the size of a No. 4 Couper's lacrymal probe. This is passed through the pupil at its upper portion and the lens is made to "lie down" as they express it. Sometimes they fail, and, as in a case seen by Dr. Helm, the lens slips through the pupil.

Attention is called to the very excellent work of Dr. S. Seligmann of Hamburg, on the microscopical examination of the eye. It is published in Berlin by S. Karger, and bears the date of 1898. It contains 240 pages and it is to be hoped this work will soon be translated into English. Dr. Seligmann thoroughly covers his subject and gives specific instructions as to where and how to get the best animals' eyes for the different methods and examinations; what stains to be used, and what should be their character, and many interesting facts, too numerous to mention. Any one desiring to do this kind of work can illy afford to be without this incomparable book.

The first regular meeting of the Midland Ophthalmological Society for the current season was held the evening of October 10th at the Coates Hotel, Kansas City, Mo.

The essayist of the evening was Dr. J. H. Thompson, who presented a very well prepared paper on "Retinal Hemorrhage." It was generally and favorably discussed by the members.

Dr. W. C. Tyree described the removal of a piece of steel from the vitreous with the great Haab magnet, in New York City. The efficiency of the instrument is so great that he felt justified in investing $300 to have one sent here.

The following officers were then elected for the ensuing year: Dr. W. C. Tyree, President; Dr. J. W. Sherer, Secretary; Dr. Geo. E. Bellows, Treasurer.

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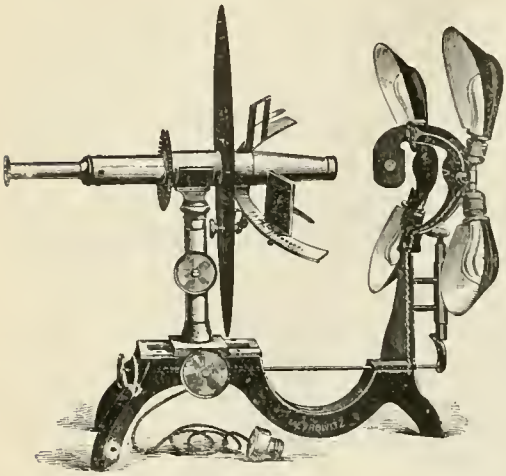

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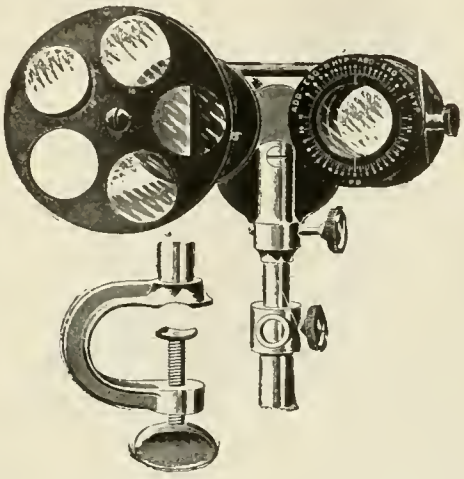

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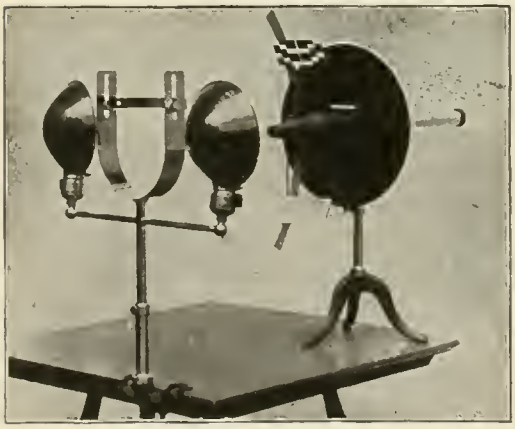

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